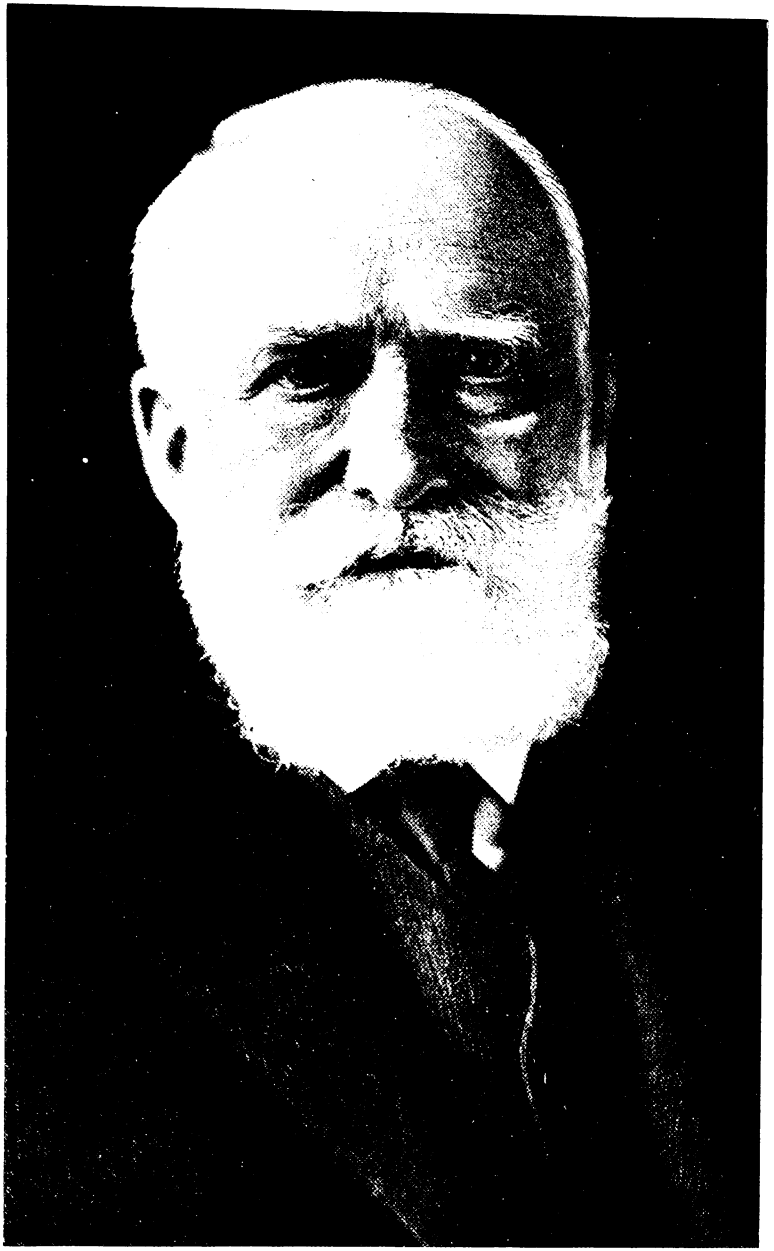


FANEUIL DUNKIN WEISSE
Died June 22, 1915

The Rationale of Immediate Root Canal Filling.

By C. Edmund Kells, D.D.S., New Orleans, La.

Foreword.

Readers—those who treat abscessed teeth by the endless chain method—those who are perfectly satisfied with their methods—those who never have any "trouble" with these teeth after they are filled—may better skip this paper, it being intended only for operators, who like the writer, do have occasional or semi-occasional trouble with root canal work.

This paper refers more especially to what are generally termed "blind abscesses"; though naturally the same rules of treatment, differing slightly in technique, apply to abscesses with sinuses.

In Fig. 1 is shown the skiagraph of a case from a class very frequently met with in the ordinary run of a dental practice. An upper lateral and a central had been "treated" and the root canals filled (?) about a year before, since which time these teeth have never been comfortable. There was a slight swelling over the central, and both teeth were sensitive to pressure. *There were no sinuses.*

Upon opening into these teeth and removing the root canal fillings blood and pus welled into the pulp chambers. They were filled by the

"immediate" method, whereupon the soreness at once began to lessen, and at the end of a week the conditions had apparently returned to normal.

The cause of this trouble was the condition of the contents of the bony canals within the teeth—nothing more—nothing less.

Please note the abscesses are within the alveolar process, and the cause of these abscesses is within the bony walls of the teeth, hence *without* the alveolar process.

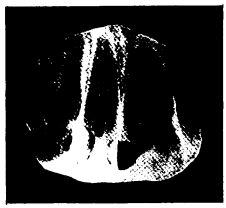


Fig. 1.

Parenthetically, let us remark that the dentist has not yet been born who ever did or can cure an abscess. The best he ever did or can do is to remove the cause. Nature does the rest.

Such an abscess will probably be cured by nature if we remove the cause. The cause of the abscess—that is the contents of the root canal—can be immediately removed by:

1. Extracting the tooth, root canal, its contents and the whole outfit at one and the same time, whereupon nature proceeds at once (usually) to affect a cure, and,

2. Removing the refractory contents of the root canal only. Should this be done and the canal left empty, the canal will be refilled by capillary attraction with septic (?) material from the abscess beyond the apex of the root and thus the irritation will persist and the abscess continue.

But, and here is the crucial point, if after removing the cause by cleansing the canal (which usually can be done in a tooth of the character illustrated, well within the hour), and it is immediately antiseptically and hermetically filled with some non-absorbent and antiseptic filling material, the cause of the abscess has been as clearly removed as if the tooth had been extracted, re-infection of the canal is rendered impossible, and nature at once proceeds to take care of the infection (?) within the alveolar process, and a cure results.

The facts are that just such teeth can be filled in just this manner successfully; so we must adopt our theories to our clinical facts, and set to work to learn just why this is good practice.

Note the interrogation point after the words *septic* and *infection,* and for this reason. It is not possible to determine by any skiagraph whether or not the region is infected. The mere fact that pus is shown does not mean that it contains organisms, and without a bacteriological test it is absolutely impossible to determine its nature.

From the results observed from years of empirical root canal work, the writer concludes that some of these canals are infected and others are not infected, and when infected the number and virulence of the organisms may vary greatly in different abscesses. And this introduces a new conception of "things as they really are," resulting possibly to our great advantage.

Fig. 2.

Fig. 3.

It is not suggested that the filling of root canals by the writer by either the immediate or by the endless chain methods give one hundred per cent. of successes. A small proportion of cases do give trouble and plenty of it, the after treatment in such cases not being within the province of this paper, but there is no larger percentage of trouble by this immediate procedure than by the method of more or less protracted treatment; in fact it is really believed to be less.

No more convincing argument can be offered to those who are willing to be convinced, for this immediate root filling proposition than the ordinary practice of replantation.

In Fig. 2 is shown a skiagraph of an abscessed lower cuspid which the writer failed to cure. The picture well shows the amount of alveolar structure involved. The tooth was extracted, its root put in condition and immediately replaced. No treatment was given the abscess in the alveolar process. Some of the pus naturally exuded in the process of irrigating the socket. No curetting was done. The abscess was cured by this immediate treatment and the tooth is O. K. at this writing, but it should be noted that an *antiseptic* method of replanting was used—no attempt at asepsis being made.

In Fig. 3 is shown the conditions obtaining at the end of this root several years later.

Such an abscess as that shown in Fig. 1 might be treated for weeks or until one tired, and if originally septic, might finally become sterilized, when at the last moment a little septic matter gotten into the canal during the operation of filling would start the whole trouble over.

The universal process of sterilizing a root canal is, I believe, to wrap cotton on a broach between the fingers and wipe out the root canal with it. Ye Gods! what a sterile process!

Where is the surgeon to-day, who after handling such bacteria laden objects as the levers of a dental chair, an engine handpiece, etc., would wrap root canal instruments taken from a bracket table, with cotton with his bare hand and swab out the abdominal cavity with it? Answer, buried. Patients buried, too.

Anyone who really believes he fills root canals *aseptically*, could possibly have his eyes opened if he would get a good bacteriologist to stand by some time and take a few cultures from his aseptic root canal dressings, filling material, broaches, etc., and from his hands as well, just as he is operating.

However should he prefer the contentment of living within the golden glow of his illusionary asepsis, then he may best not make the test.

The facts are that aseptic root canal work is not practical. Therefore, antiseptic work becomes imperative. Let us perfect ourselves along this line, treat root canals antiseptically and fill them antiseptically with antiseptic materials and the best results will be obtained.*

Conclusion. The writer deserves no credit for his ideas upon immediate root filling. He was taught this by Cassius M. Richmond—he of the Richmond crown fame—many years ago, and has practised it satisfactorily and continuously ever since. A small proportion of teeth so treated do give trouble. Possibly, at this late day, the writer is now on the track of a slight change in technique which may decrease this proportion somewhat—he does not know—but he never expects to reach that state of perfection that one hundred per cent. of such cases treated in any manner will be successful.

Paste for Filling Root Canals.

By Dr. W. I. Prime, Laconia, N. H.

I never apply rubber dam for root canal treatment, but wash out canals at intervals with tepid water while cleansing with broaches.

*For opposite views on this subject see article by Dr. Elmer S. Best, in this issue, page 498.—Editor.

After canals are thoroughly cleansed and dried, I use the following paste as a root canal filling:

℞ Alum Exsic.,
Thymol,
Glycerol, āā. 5j.,
Zinc Oxid, q.s. to make stiff-paste.—M.*

Force this paste up to apex of root with Jiffy tube, or if canals are small, apply on smooth broach, after which take a hard cotton pellet and force entire contents up in canal by pressure, until patient experiences a sensation that the paste has reached apex.

In doubtful cases of abscess or putrescent pulp treatment, I use paper point dipped in phenol, changing this dressing every two or three days, until canal dressing has no bad odor, then fill canal as mentioned.

In pulp extirpation, under novocain suprarenin, after cleansing canals and drying thoroughly, I fill canals immediately with this paste. Seal in with Harvard cement and insert permanent filling. As this paste is a mummifier, should any fibers of nerve tissue remain in canal, they will be taken care of just as though entire pulp were mummified.

I have used this method for two years, and not one case has failed to my knowledge.

I have not described the details of canal treatment but the above is written with the understanding that in case of putrescent pulp all treatment previous to final sterilizing of canals with phenol had been done.

I never ream canals nor use formaldehyde in my office at all.

Criticism of a Mouth Hygiene Educational Film.

By Reginald Sayre, M.D., New York.

The present movement for instruction of school children as to the proper care of their teeth is most admirable, but in order that it may do good and not harm, the movies by which this information regarding the care of the teeth is to be spread broadcast throughout the country, should be prepared with intelligence.

At the recent meeting of the American Orthopedic Association, an education film was shown which first exhibited the various bacteria which are found in the human mouth, and described the damage which their transportation to various other parts of the body might cause. A skull was then shown whose teeth were cleaned with floss silk and a tooth brush in a very thorough manner by a young lady. A pecan nut, and

*See discussion of this topic in "Around the Table."—Ed.

later on a Brazil nut, were placed in the jaws of the skeleton, and by means of a dynamometer we were shown that a force of two hundred and fifty pounds was necessary to crack the nut. The young lady then demonstrated in her own mouth, the proper mode of cleaning the teeth and gums with silk and tooth brush, and then proceeded to crack a Brazil nut with her teeth, and eat it.

The logical inference to be drawn from this series of pictures, was, that if you kept your mouth clean and your teeth in good condition, you would be enabled to crack Brazil nuts requiring a force of two hundred and fifty pounds, with impunity, and if this film is shown about the country it will result in children subjecting their teeth to very abnormal and unwise strain.

I visited one of our large moving picture shows the other day, and in the "Topical Review" saw a class of school children going through the tooth brush drill, and I am very glad to say that they did not wind up the exercise by a nut cracking contest, and I presume that the majority of the films which are to be released all over the country in the near future, will not contain this objectionable feature, but as this film was shown to an audience of medical men, and we were informed that it was to be sent about the country for the purpose of instructing children what they should do with their teeth, it seems to me wise to raise a word of caution lest more harm than good be done by injudicious methods.

The strength of the teeth, and the bones, ligaments, and muscles, differs in various people, and because we occasionally find freaks in museums and circuses who can, apparently with impunity, bite pieces out of beer glasses and plates, and eat them up, and lift horses from the ground by their teeth, is no reason why the average person should subject the teeth to such unwise strain, and to suggest to children that they should do such absurd things as to crack nuts with their teeth, is extremely reprehensible, and should be stopped.

Oral Osteitis in its Relation to Arthritis.

By Byron C. Darling, A.B., M.D., New York.

Instructor in Orthopedics, College of Physicians and Surgeons, Columbia University; Roentgenologist, St. Vincent's and Ruptured and Crippled Hospitals.

Read before the Central Dental Association of Northern New Jersey, April 20, 1914, at Newark, New Jersey.

The need for exact diagnosis and the removal of the focus of infection as the first step toward the treatment of a particular condition, is becoming generally recognized by the medical profession. A study of the literature discloses active measures being carried on along this line in each branch of the profession. Rosenow, Billings, Haskins, Hastings, Camac, Joseph Collins, and others, each an authority in his particular field, have recently contributed valuable articles on the subject.

The *need* for exact diagnosis is generally admitted, but the hidden focus often baffles definite localization; and treatment, consequently, has been lacking in directness and efficiency. This paper is written from the angle obtained by the use of the X-ray. The field of the X-ray is constantly widening and its diagnostic value increasing as its technical perfection is increased and its findings assimilated and checked up.

Some of these hidden foci of infection, while not of a virulent nature, are often of a chronic and incapacitating character, and of most serious import. Their clinical manifestations, in the order of their importance, are, first, because more frequent, those of the chronic joints, single or multiple, usually progressive with periods of improvement, directly related to the increase or decrease of the resistance of the patient. That there is a great need for definite diagnosis in these cases is evidenced by a statement made recently by J. B. Murphy, that there had been no ad-

vance in the treatment of chronic joints in fifty years, the treatment being expectant and palliative. Next in order, shown notably by the work of Rosenow, are ulcers of the stomach and intestines, endocarditis, myocarditis, myositis, migraine, neuralgia, neuritis, and neurasthenia.

Much has been written by physicians and dentists upon the mouth as a source of infection in all of these conditions, and it is with this aspect of the value of the X-ray as a means of exact diagnosis that this paper chiefly deals.

Fig. 1.

The teeth fall between the province of the dentist and that of the physician, who seldom meet for co-operation in diagnosis. Whether the patient, child or adult, has ever had a dentist or not, the preponderance of possibilities points to the roots of the teeth, the gums, and the jaws, as harboring some focus of infection. The teeth being some thirty-two in number, having from one to three roots to the tooth with pulp in each, and the root socket about each root, it follows that any decay extending to and causing the death of the pulp or nerve becomes a source of infection which, if untreated, must result in a root abscess, osteitis, with or without fistulas (gum boils). (Figs. 1, 2, 4, 8 and 12.)

In the gums and alveolar process where Riggs' disease (pyorrhea alveolaris) is present, an X-ray examination is of the greatest importance, showing, as it does, the absorption of the aveolar process about the root, varying from an open space the width of a line between the tooth and the socket to that shown by a tooth loose in a bed of swollen and inflamed gum with disappearance of the adjacent bone (Figs. 3, 4 and 7). But more important is the demonstration of the root abscess cavities, early and minute or large with fistulas; and finally, the X-ray is a means of knowing whether a root has been completely and properly

filled to its apex by the dentist (Fig. 13). Wherever any suspicious condition of the mouth brings the teeth into question, the matter should be looked into thoroughly by both the physician and the dentist, leaving no hidden focus undiscovered. Frequently a patient will say: "I have been to the dentist and he says my teeth are in perfect condition"; and yet an X-ray examination will show definite lesions (Figs. 8 and 12).

To identify the invading germ and prove its derivation from these foci is a laboratory task beset with many difficulties; but the successful

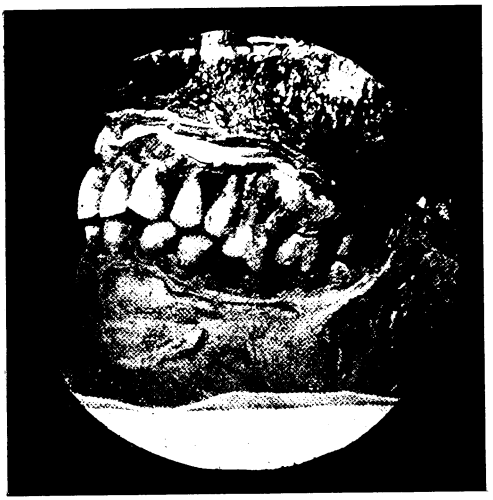


Fig. 2.

Fig. 3.

work already done by Rosenow, Hartzell, Hastings, and others, supports the idea here emphasized.

Diagnosis of Infectious Diseases.

The writer does not assert that the mouth is the sole source of infection in arthritic conditions, but is mindful of the many foci of infection from which virulent poisons may enter the system. In ascertaining certain other of these foci of infection, the X-ray is of equal diagnostic value. With no attempt at arrangement in order of importance, but rather to recall the various sources of infection and to advocate the necessity of making the search thorough—for any one case may be the sum total of several infections—a routine search may well begin at the head, first, in the respiratory tract: then the nose, throat and tonsils; middle ear and mastoid; accessory sinuses; glands of the neck; lungs, mediastinal glands. An X-ray examination is recognized by the otologist as of the greatest value in mastoid conditions, and by the

rhinologist as of considerable value in sinusitis. In lung conditions, it is the sole means of demonstrating the glands at the root of the lung, as well as supplementing greatly the physical examination of the lungs themselves.

Second in the order of search is the alimentary canal. In the stomach and duodenum, Rosenow has shown that the streptococcus viridans injected into the blood stream of animals will produce ulcers, which, theoretically, at least, may be located anywhere in the gastro-intestinal

Fig. 4.

Fig. 5.

tract. The X-ray in its possibilities for the localization of these menacing lesions is commanding attention.

In the recently rediscovered field of intestinal stasis, with its so-called auto-intoxication, the kinks and adhesions can often be demonstrated by the X-ray. This field is too new to be free from errors of judgment in interpretation, and it would seem as if the surgical procedures advocated are too capital, if not entirely wrong, and should be withheld, at least, until every other possible source of relief has been tried out and has failed. The possibility of auto-intoxication from retention of the stomach contents due to pyloric obstructions, duodenal kinks, atony of the musculature, or gastro-enteroptosis, can be shown by X-ray examination.

In cases of infected gall-bladder, for showing the presence of biliary calculi, the X-ray examination is becoming more and more dependable, showing gall-stones where they have sufficient calcium salts in their com-

position. Claims are being made recently for from fifty to seventy-four per cent. positive results (Pfahler).

In the genito-urinary system with its foci, such as abscesses in the kidney from calculi, or possible ulcerations from abrasions caused by

Fig. 6.

Fig. 7.

calculi in passage through the ureter, the X-ray findings are especially satisfactory. Following these as foci of infection are pyelitis, cystitis, urethritis, prostatitis, and seminal vesiculitis, in the diagnosis of which the urologist and bacteriologist have made great strides in recent years.

All these various foci of infection must be carefully considered in order to make an exact diagnosis, no one of them as yet having a monopoly as a focus of infection in arthritic conditions.

Histories.

Dr. K.; age 30; pyorrhea as yet uncomplicated. (Fig. 6.)

Onset was insidious, with pain in one tooth and repeated abscess formation around it. Pain became general and four teeth which were loose were removed. Two more are still loose and will probably have to be removed. There has been no systemic or other local disease.

Mrs. A. S.; age 30; referred by Dr. H. A. Cossitt; pyorrhea complicated with stomach and intestinal trouble. (Fig. 7.)

Fig. 8.

Stomach and intestinal trouble began at twenty-one years; has improved lately, after use of autogenous vaccines. No "rheumatism" has developed as yet.

Mr. X.; age 60; apical abscess and pyorrhea with years of chronic multiple arthritis. (Fig. 8.)

Patient has had chronic "rheumatism" of all his joints—hands, wrists, elbows, feet, spine, etc. X-ray examination of these joints shows evidence of spur formation, erosion of cartilage, and arthritis in different stages. For years patient has had a history of gum-boils and dead teeth, some of whch are due to unscientific dentistry. Several other teeth show large cavities as a result of neglect and no dental treatment.

Mr. B. F. M.; referred by Dr. W. H. Haskin; apical cyst or abscess (Fig. 9).

Tooth causing the cyst was crowned seven years ago; left bicuspid,

eight years ago. Present condition began three months ago with hard painful swelling. There has been no other disease.

Mrs. C. E. T.; age 37; referred by Dr. W. H. Bates; apical abscesses and pyorrhea, optic atrophy, and blindness in one eye. (Fig. 10.)

For many years patient had much dentistry done, including many porcelain and gold crowns. August, 1913, patient had a bilious attack. About six weeks later an examination showed total blindness of one eye with no change in the optic nerve; but examination four months later

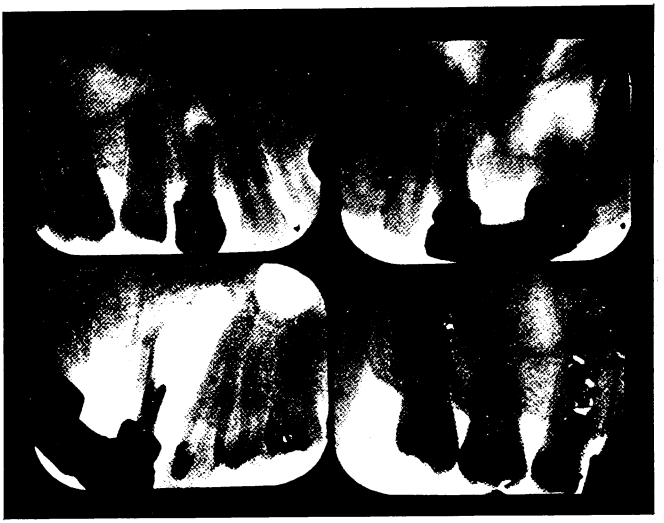


Fig. 9.

showed atrophy of the nerve. None of the lesions around the teeth had ever caused any pain.

Miss S. L.; age 22; referred by Dr. Virgil P. Gibney; apical alveolar abscesses and chronic arthritis. (Fig. 11.)

Patient was incapacitated for four years by left hip joint condition. For first seven months there was limping and pain in the joint when going up and down stairs, but very little pain when quiet. For the last two years patient has been confined to bed as a result of joint condition and of treatment with plaster cast. No other focus of infection could be found other than that in the teeth, the history of which antedates the joint condition.

Mrs. E. H.; age 50; referred by Dr. P. W. Roberts; pyorrhea and multiple arthritis. (Fig. 12.)

Patient had arthritis for seven years, beginning in the hand and extending to the wrists, elbows, shoulders, knees, and ankles. Right and

left elbows became partially ankylosed, and both knees completely ankylosed. Patient has had bad teeth since childhood, having lost all but six, which were removed about six weeks ago. Since then knees were straightened under ether, and all pain has now disappeared. Elbows and wrists are still painful. Patient walks but cannot rise from a chair.

Fig. 10.

Conclusions.

1. As a first rather than as a last resort, special attention must be paid to the condition of the teeth. The hidden focus of infection may be either a blind or a fistulous alveolar abscess (osteitis).

2. Good health demands the constant close attention of a conscientious and scientific dentist.

3. Much old and unscientific dentistry, such as bad crown and bridgework and root fillings that are not scientific, must be removed, and the conditions remaining properly treated; failing this, merciless extraction and false teeth, but a clean mouth.

4. Pyorrhea alveolaris (Riggs' disease) is a menace to good health; it is a chronic ulcer of the gum and finally of the bone, and assuredly a focus of infection.

5. There should be co-operation with mutual recognition of responsibility between the physician and the dentist.

6. The search for the hidden focus of infection, while being very extensive and careful in the oral cavity, should not be confined to it but should extend over every possible seat of infection.

7. Even though the hidden focus be found and the cause of the systemic infection removed, the seed of the disease has already been

Fig. 11.

sown broadcast, and many expedients will be required before a recovery is effected.

In summing up, all mouth conditions should receive the most searching and scientific attention. It is of the greatest importance that there be established a clinical attitude which will insist that no treatment of these obscure diseases is complete without putting the teeth in order by dentistry that is beyond question.

I am indebted to Dr. Virgil P. Gibney for the privilege of showing X-ray examinations of the teeth of some of his private patients; to Dr. W. H. Haskin for the use of illustrations from his comprehensive collection of wet and dry specimens; and to Dr. R. Ottolengui, dentist and editor of the Items of Interest, for advice and encouragement.

Description of Illustrations.

Fig. 1. Dry specimen; 1 and 1a. Decay of cuspid. Infection extending to the apex produced large area of necrosis anterior to the antrum. 2. Alveolar absorption from pyorrhea. Other teeth likewise.

Fig. 2. Wet specimen; Lower jaw—snags or roots, a frequent source of apical osteitis. Upper jaw—extensive pyorrhea (Riggs' disease); note the receded ulcerated gum, due to disease and absorption of the alveolar process beneath.

Fig. 3. Dry specimen: Stripping of all the teeth from alveolar absorption, expecially the molars, which have become loose foreign bodies. Compare with Fig. 2.

Fig. 12.

Fig. 4. Wet specimen: The extreme results of alveolar abscess which probably started by death of the pulp, followed by infection and caries of the alveolar bone.

Fig. 5. Wet specimen; Upper jaw—extreme recession of gums, due to absorption of the alveolar process from beneath, probably from pyorrhea. Lower jaw—old snags; neglected roots a more frequent cause of apical disease than unscientific root treatment by the dentist.

Fig. 6. Radiograph shows infection and bone destruction all around the cuspid tooth, and is a very good example from life of what must have occurred around, let us say, the molar in Fig. 2. This apparently was due to a dead pulp which has not been removed by the dentist.

In Fig. 7 there is the same condition together with resorption of the ends of two roots in the upper right hand picture. In the left hand picture there is probably some pyorrhea and loss of bone between the teeth. The same is probably true in the picture below.

Fig. 8. In the upper left hand picture there is an abscess at the end of the root, probably due to faulty root filling. In the upper right picture there seems to be an abscess at the end of the root due to death of the pulp and lack of treatment. In the lower right hand picture there is another example of faulty root canal work.

In Fig. 9, upper left, an abscess on a crowned tooth probably due to faulty dental work. In the right upper picture, a large abscess probably

due to faulty dental work with possibly a piercing of the side of the root during the work. The left lower picture is the same tooth; here we see the metal post protruding through the end of the root.

In Fig. 10, upper left, there are abscesses over teeth in which there are faulty root fillings; same in the upper right; ditto lower left and lower right. In the lower right there is a large abscess at the end of a tooth which carries a crown, probably due to the death of the pulp after the tooth was crowned. This is one reason why the best men insist that

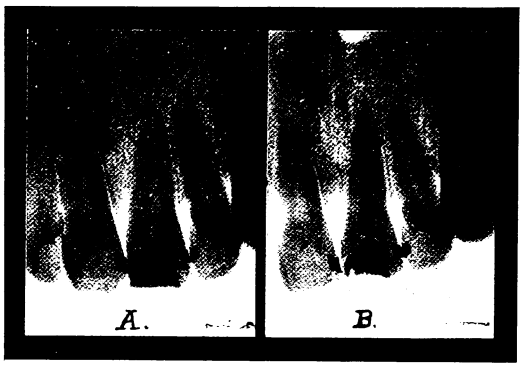


Fig. 13.

all teeth which are to be crowned should have the pulps removed and the roots properly filled first.

In Fig. 11, above, two films of same teeth—there is an abscess at the end of both the bicuspids due to faulty root canal work in the first, and entire neglect in the second. The molars show long, food collecting crowns.

Fig. 12. Shows infection around roots which have been left in the mouth and stripping of the alveolar process from pyorrhœa alveolaris. All the teeth are affected.

Fig. 13. Radiographs illustrating scientific treatment. A. Tooth with wire in root, showing that canal has been cleansed to the end. B. Same tooth showing root filled to the end. (Operation and radiographs by Dr. R. Ottolengui.)

Bibliography.

Rosenow, E. C., and Coombs, C.: "Myocardial Lesions of Rabbits Inoculated with Streptococcus Viridans," *Lancet,* 1913, II, 1677.

Rosenow, E. C.: "Relation of and Lesions Produced by Various Forms of Streptococci with Special Reference to Arthritis," *Ill. Med. Jour.,* 1914, XXV, 1.

Rosenow, E. C.: "Studies in Endocarditis and Rheumatism," *Journal-Lancet,* 1914, XXXIV, 1.

Rosenow, E. C.: "Transmutations within Streptococcus-Pneumococcus Group," *Jour. of Infect. Dis.,* 1914, XIV, 1.

Billings, Frank: "Clinical Aspect and Medical Management of Arthritis Deformans," *Jour. Am. Med. Assn.,* 1913, LXI, 2008.

Rosenow, E. C.: "Etiology of Acute Rheumatism, Articular and Muscular," *Jour. of Infect. Dis.,* 1914, XIV, 61.

Rosenow, E. C.: "Etiology of Arthritis Deformans," *Jour. Am. Med. Assn.,* 1914, LXII, 1146.

Rosenow, E. C.: "Lesions Produced by Various Streptococci; Endocarditis and Rheumatism," *N. Y. Med. Jour.,* XCIX, 253.

Rosenow, E. C.: *Jour. Infect. Dis.,* 1910, VII, 411.

Hastings, T. W.: *Jour. Exper. Med.,* 1914, XX, 52, 72.

Camac, C. N. B.: "Dental Sepsis: Relation to System," *Am. Jour. Med. Sc.,* 1914, CXLVII, 186.

Billings, Frank: "Chronic Focal Infections and Their Etiologic Relations to Arthritis and Nephritis," *The Archives Int. Med.,* 1912, IX, 484.

The Responsibility of the Dentist in the Care of Pulpless Teeth.

By Elmer S. Best, D.D.S., Minneapolis, Minn.

Read before the Second District Dental Society, April, 1915.

During the nineteenth century, Lister, Bassi, Semmelweis, Jules Lemaire and Battini advocated the use of antiseptics for the purpose of overcoming wound infection after operations. It was the proof that suppuration of wounds was the result of microbic infection which made the great turning point in the history of surgery in 1880.

Cleanliness alone, and the use of antiseptics in the wounds alone were tried, and have been tried since the Listerian method, but they have always failed.

Asepsis as it is at present understood and practiced indicates a condition of absolute sterility, the result of mechanical cleansing, antiseptics, or heat, or all three. An aseptic operation therefore, means one in which all the instruments, sutures, ligatures, dressings, field of operation, the surgeons hands and everything, in fact, coming in direct or indirect contact with the wound have been thoroughly sterilized and in which no antiseptic solutions are used during the progress of the operation.

The ideal operation of to-day is an aseptic and not an antiseptic one. A small volume published by Hunter Robb in 1894 and another by Carl Beck in 1895, dealing with aseptic surgical technic, put this subject in a comprehensive light before the American profession, and it has grown in popularity and practice ever since. It is extremely doubtful whether, even in infected wounds, strong antiseptic solutions exercise the retarding effect on the infection that was once supposed.

Source of Wound Infection.

By far the most common source of wound infection is the hands of the surgeon and his assistants. The patients skin may also be the source of infection. Infected sutures, ligatures, instruments and dressings are frequent sources of infection, but we should not fall into the habit of attributing our infections to these until we have absolutely ruled out all possibility of infection having arisen from our own hands or those of our assistants or nurses. The saliva is also a source of infection.

Methods of Overcoming Wound Infection.

In the modern aseptic operating room, germicides and antiseptics do not play so important a part as they formerly did. This is largely due to the fact that heat is used whenever possible in the preparation of sutures, instruments, dressings, etc., and to the fact that in uninfected tissues no antiseptic solutions are employed. It must also be remembered that germicidal agents possess the disadvantage or exercising a more or less destructive action on body cells and consequently their use is not warranted in clean wounds.

This brief account, gentlemen, tells us the crisis through which surgery has passed. The dentists have now reached their crisis and are to-day passing through the most revolutionary epoch in the history of dentistry.

The reason for this is that the pulp canal operation, which in the past has been considered a comparatively simple and unimportant one, to-day stands charged by the thinking members of the medical and dental professions as the cause of as much, if not more, suffering than any other operation. The reckless manner in which we have been removing pulps from the teeth of our patients with hardly a thought of the almost certain infection which follows the ignoring of surgical cleanliness, and replacing them with artificial substitutes, most certainly shows that we have had no adequate conception of our responsibility in handling these cases.

Dr. W. A. Price, in discussing this subject recently said: "What is the cost of failure? The estimate of the past has been a tooth; the estimate of the hour is possibly years of suffering, possibly a human life."

Those who co-operate with the physicians in focal infection cases realize this to be the real situation. Our responsibllity is increasing by leaps and bounds and a fuller realizaton of this is brought home to us by reading papers which were presented by Gilmer, Billings, Mayo, Rosenow and Craig at the last meeting of the American Medical Association.

From the fact that human lives are unquestionably being saved by the extraction of pulpless teeth, which represented what we considered all that was possible in pulp surgery, it would appear that we have had an entirely wrong conception of just to what extent nature's ability reaches in shouldering the responsibility which we have been shifting to her shoulders.

I do not believe that it is possible for any dentist to make an ideal operation of every case that comes into his hands, any more than it is possible for a surgeon to make an ideal operation of every case he handles.

We have and always will have human error to contend with, as well as mechanical obstacles of varying degrees of difficulty to overcome, but to my mind the principle trouble in the past has been that these two things have been very greatly exaggerated. The skilled surgeon has a high percentage of successes, but he also has his failures. This is not said with the idea of excusing anyone who is so mentally and physically lazy that he will not exert himself to do the utmost of all that lies within his power, but it is a plain statement of human efficiency.

Removal of Pulps.

It would appear at present that about ten per cent. of the teeth present conditions which render the removal of pulp tissue and the placing of an artificial substitute very uncertain if not impossible. I can not imagine that the tooth pulp was ever intended to be removed in wholesale fashion, but we were supposed to keep it as long as we kept the tooth; for unquestionably a tooth that has its pulp in good health is a better unit of the masticatory apparatus than one which is pulpless. So I think it is wise to follow the plan of never removing a pulp if it is possible to save it with an assurance of future health and comfort to the patient.

We have for years hoped for some attachment for bridgework that could be universally adopted for use on vital teeth and which could be so constructed that it would not in any way endanger the vitality of the pulp. Over twenty years ago Dr. Carmichael introduced his three-quarter crown, which so far as the conservation of tooth structure in preparation for abutments is concerned, has not been improved upon. Yet you all know the existing possibility of pulps dying under large metal restorations. This was proven recently when I had my attention drawn

to a beautiful piece of bridgework which had been placed upon two vital teeth, the pulps of which had died, and the resulting infection was so extensive that both teeth had to be extracted.

While it is true that we have had almost unlimited amount of trouble from pulpless teeth where our operation has been a failure, yet I am firmly of the belief that our salvation lies in perfecting this operation where it is indicated, and in incorporating with it the maintenance of asepsis instead of changing over into a field that is most certainly not free from danger even when handled by the most skillful and mechanical dentists.

When a tooth has had its pulp removed in a surgically clean manner and the opening guided by radiographs, and then the canals filled to the foramina in a sensible manner, I most emphatically contend that a great error is being committed if we denounce such a tooth with assurance as a future focus of infection. Especially is this true when we have radiographs showing good pulp canal operations, few though they may be, which have been performed in years gone by, in such a manner as to preserve the apical tissue, and when at the same time we found in these same mouths other pulpless teeth which contained very indifferent operations which, upon bacteriological examination, are proven to have infected periapical areas, associated with extensive bone destruction.

In his latest book on dental histology, Dr. F. B. Noyes draws attention to the rich blood supply of the peridental membrane, and Dr. G. V. Black, in a personal communication, says that such blood supply would not be affected by pulp removal. As to the formation of scar tissue resulting from a wound caused by the severing of the pulp at the foramen and the consequent formation of an area of lowered resistance, I have never seen any proof offered that such is the resulting condition. We are not justified in assuming that it inevitably follows for as Adami says: "It is or used to be taught that every wound must leave its scar, but, as every man who shaves knows, this is not the case. Of late we performed an autopsy on a case in which a laparotomy had been performed within three months in which close examination externally failed to detect the operation wound, while internally it was only indicated by omental adhesions and absence of important pelvic viscera."

Dr. Rhein has done much interesting work along the line of ionic medication. This and other published work along this line makes very profitable and interesting study and its application is very gratifying.

Root Canal Fillings.

The dental profession to-day stands challenged by both the medical profession and the laity on account of this hidden work which we have been doing. I do not say this in any spirt of censure, for in

years gone by we did the best we could and purposely or otherwise tried to shut our eyes to the consequences. But we should be happy to say that the standards of the past are not those of the present nor the future, and we are now doing vastly different work along this line from what we did formerly; at least, those who are using radiographs in checking up their operations.

An examination of two hundred and eighty-eight cases of pulpless teeth showed the following conditions:

Mechanically defective operations with rarefied periapical areas, one hundred and seventy-seven.

Mechanically defective operations without rarefied periapical areas, forty-one.

Infected areas from gangrenous pulps, forty-four.

Mechanically perfect canal operations, fifteen.

Mechanically perfect canal operations, showing rarefaction, one.

Vital tissue under canal filling, seven.

Infected areas over vital teeth, two.

Arsenical necrosis, one.

Bear in mind that the loss of bone around a root apex, as it is revealed to us by the radiograph, most emphatically does not mean that this condition followed the operation in the root, but may have preceded it, and while we say that seventy-eight per cent. of imperfectly filled roots carry with them periapical irritation, shown radiographically, we are not stating that one is necessarily the sequel of the other. We do not see how anyone can feel justified in making positive statements regarding abscesses resulting from pulp surgery, unless he is prepared to offer a detailed statement of each individual case, substantiated by radiographs before and after the operation, as well as bacteriological reports. To put this in concrete form, we must consider those cases where previous to our filling the roots we have had a gangrenous pulp to deal with, and also those cases where, from the use of arsenic or other drugs, there is apical irritation resulting in granuloma.

It used to be generally conceded that about ten per cent. of our old pulp canal operations had fillings reaching the apical region, and in some of those which did reach the apex we found shreds of non-vital pulp tissue lying alongside of the canal filling, and were able to recover pyogenic bacteria from this material. Heaven knows the condition is bad enough, but why condemn the whole operation on such a showing? Where were the medical profession before they found adequate means of preventing infection during their operation? We have not done the spectacular things they have done in handling the lives of their patients, but occupy the same old boat they did, and when it starts to sink with us

as it did with them, we are forced to save ourselves. When the dental profession as a whole learn how to prevent the infecting of their patients, then and only then can they lay claim to an appreciation of the difference between antiseptics and asepsis in pulp surgery and pulp canal filling.

The mere fact of not getting a canal filling to the apex is not the whole offense, although it is a most serious one. In the course of our operation we may, by our carelessness, introduce infection into the canal and carry it into the periapical space, or leave it in the canal in contact with non-vital tissue; thereby qute easily establishing a very nice little focus of infection which may later be the cause of most serious trouble.

It would seem that there is the same relative proportion between the number of cases infected during this operation and the number which the surgeon infects, as the difference between the precautions the surgeon takes and those taken by the majority of dentists. I will leave it to you whether or not we are reaping a just harvest for what we have sown. The offense seems all the greater when we consider the comparative simplicity of providing a means of doing the operation in an aseptic manner.

No longer can it be said that simply because we do not have the symptoms of acute septic pericementitis or the establishment of the fistula, that that particular tooth is not giving the patient very great trouble, or is not rapidly becoming the seat of a very serious trouble later on. The evidence which we observe upon looking into the mouth is sometimes the weakest evidence which we can get, for we see nothing below the surface, and it is that part of the tooth which is the most prolific source of trouble.

Relation of Dentist to Physician.

We sometimes criticize the physicians for making a diagnosis of certain conditions which he finds in the mouth, and yet my experience has been that the physician is only too willing to turn over to the dentist everything which lies within his sphere, provided he can handle it in consideration of the patient's best interests. The question has been raised by a number of my medical friends that the dentist interested in the case adopts a very peculiar attitude towards cases of focal infection, where it is suspected that the focus is in the jaws, and more especially in those cases where an infection may have developed under some restoration which he has placed in the patient's mouth.

In other words, their real interest is about on a par with the interest a man has in a case of orthodontia when he takes impressions and sends the case into a laboratory with a request to construct an appliance for it. The poor laboratory man is up against a proposition which may be

almost an impossible one, for even if he does know something about the work he is under the handicap of never having seen the patient. Let our relations with the physicians be of the most harmonious nature and by our co-operation we can render our patients more valuable service.

The dental profession never has had such an opportunity as at the present time for doing something really worth while for humanity and I am confident they intend to take full advantage of the opportunity. To me, it is the greatest comfort when cases are referred by physicians to be able to make an exhaustive search of the teeth and jaws, first with plates, and then to check up the suspicious areas with films, then testing the teeth for vitality with the faradic current, thereby locating the teeth which may possibly have non-vital pulps, but which show no apical disturbances in the radiograph.

There is nothing I know of, in my relation with the members of the medical profession, that compares with the satisfaction derived from co-operative work in making these examinations, as they are only too happy to have us assume the responsibility of this part of the work as they realize that it is distinctly within the dentist's field.

While this work is most fascinating yet it requires a most careful preparation and familiarity with the anatomy of the teeth and jaws and adjacent parts, for advice on this subject must be dependable when one enters the field as a consultant; otherwise the advice only results in confusion and uncertainty.

At this point I wish to draw your attention to certain conditions which occasionally are found in X-ray work. There are certain cases where, owing to exostosis, we are unable to get a clear, sharp outline of the roots of the teeth and we must remember that this somewhat blurred image in the film is the true representation of the actual conditions which exist.

Sources of Infection of Apical Area.

We will now consider for a few moments the various sources of infection in the roots of teeth and the periapical areas.

Class 1.

From saliva, unclean instruments, cotton, chip blowers, canal points, unclean hands.

Class 2.

Bacteria as a thrombus lodging in blood vessels of pulp, causing interruption in the blood supply and an area of lowered resistance favorable to the proliferation of bacteria in thrombus.

Class 3.

Pulp tissue having become non-vital as a result of trauma or the use of arsenic may become the seat of infection owing to the growth of bacteria which were in the circulatory system at the time of its death or later.

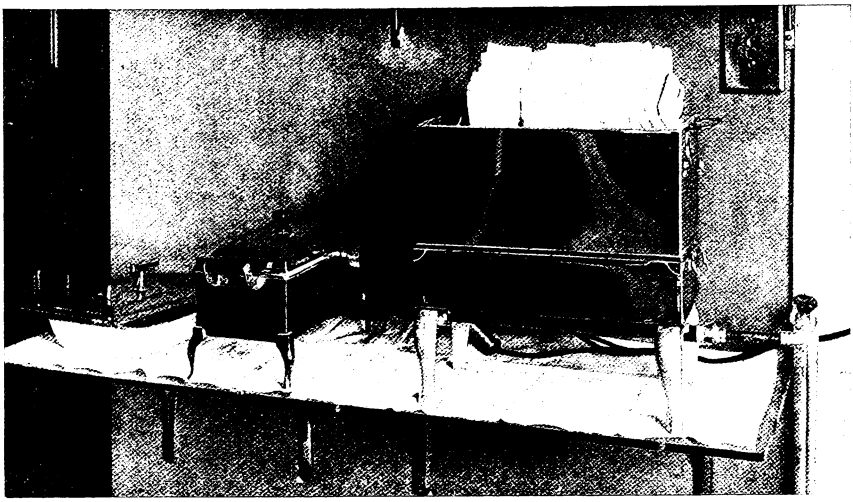


Fig. 1. Small dressing sterilizer.

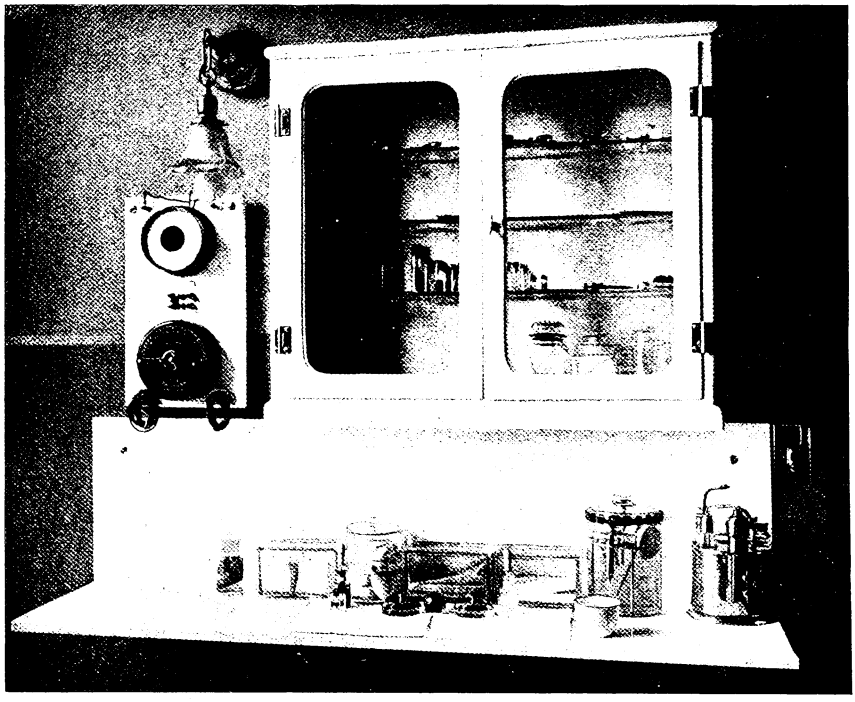


Fig. 2. Glass jars containing sterilized cotton gauze, dressing bristles, etc., waste dressing cup, medicine bottles, hypodermic outfit.

Class 4. Removal of all the pulp tissue and the failure to fill the root to the apex leaving a space in the root apex where bacteria may proliferate away from the immunizing mechanism or action of the phagocytes. The bacteria may become lodged in this area, escaping from the general circulation,

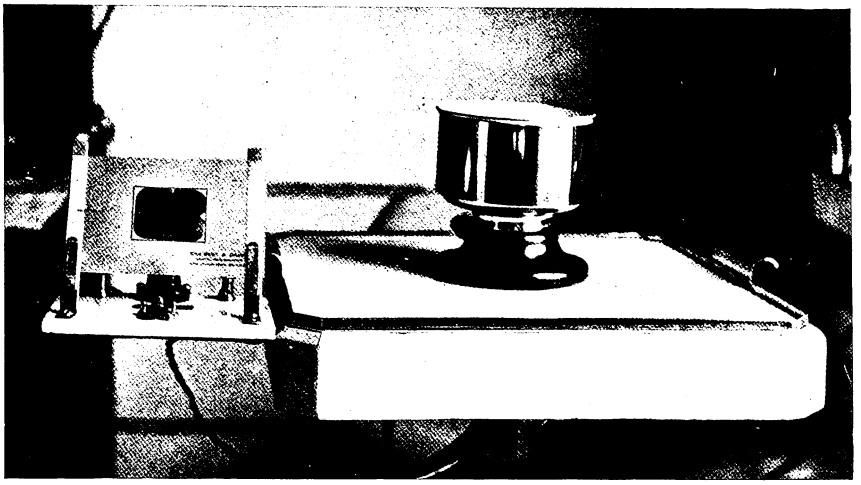


Fig. 3. Bur and broach sterilizer.

where they were in existence as the result of a general invasion, such as an attack of Grippe, or a focus of infection somewhere else in the body.

Class 5. Destruction of periapical tissue from drugs such as arsenic or formalin used as treatment and dressings in pulp canals, causing an area of lowered resistance by causing an actual destruction of the attachment of the peridental membrane, leaving denuded cementum which maintains chronic focus indefinitely, which would be favorable to the proliferation of bacteria either introduced through the canal or from the general circulation.

An examination of twenty-six cases of chip blowers and used barbed broaches revealed—fifteen cases producing pyogenic organisms.

Twelve tests of cotton in cotton holders in common use showed—nine cases of pyogenic organisms.

Nine cases of sterile cotton handled by unclean hands showed—seven cases to be infected.

In our experiments we found that nine cases where periapical infection existed and where the pulp was infected that we found the same germ.

We also found that in twelve cases these pyogenic bacteria were in

existence in pulp canals which contained non-vital tissue and we found in seven cases so-called germicidal pastes or preparations.

Six cases of infected canals showed no apical disturbances.

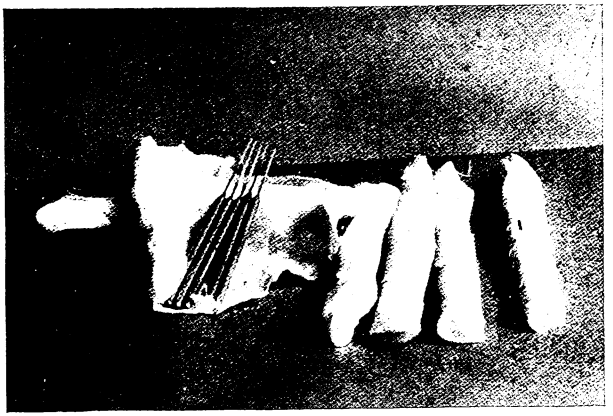


Fig. 4. Dressing bristles.

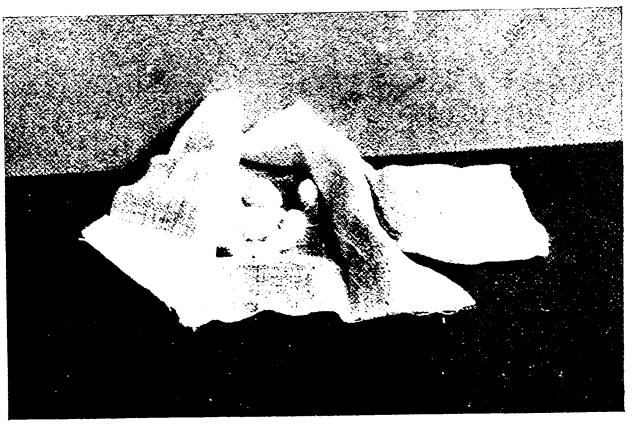


Fig. 5. Sterile cotton pellets.

Now we have traced the source of a great deal of this infection and this, together with the admitted fact that with rest and care serious cases of focal infection recover upon the removal of teeth, which in the radiograph show areas of rarefaction, seems to be strong evidence that periapical infections associated with pulpless teeth are of, or associated with, primary origin, and are under the control of the operator doing the operation. Our conclusions in this regard are the same as those of

Burchard and Inglis. In only one case did we find apical infection where no growth could be secured from the pulp canal. In this case, which was a focal infection case, the roots were filled to the apex with oxychloride of zinc cement. One other showed great bone destruction but no growth could be secured either from the tooth or socket.

In handling this subject it is with full realization that it is in the most dangerous field that the dental world offers for discussion and

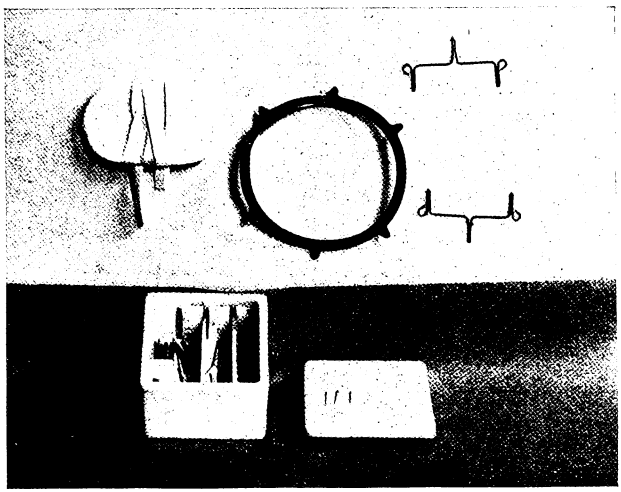


Fig. 6. Rubber dam holders. Gutta percha canal points.

writing, and that there is such a difference of opinion that it is almost impossible to agree on many points in the work. Yet it is as an earnest seeker after the truth that I present my ideas for your consideration to-night.

Root Canal Pastes.

I shall venture an expression of opinion on the so-called germicidal preparations with which the market is simply flooded to-day. It is always with a sense of shame for my profession that I see the extensive use of these preparations which the manufacturers unload upon unsuspecting purchasers in such a shameless manner, and which they in turn unload upon a more unsuspecting and more confiding clientèle. The latter case is worse than the former as in the first case only material is purchased, but in the latter services are sold. The only possible excuse I can see for the use of these preparations in the roots of teeth is that the operator knows he has left something in the root which he should not have left, and instead of removing it he places his "life saver" in on

top of it and then he is quite sure he has "no trouble from it" in the future.

The only solution lies in an almost entire non-dependence upon antiseptics in canal fillings and in the maintaining of asepsis in the operation.* This leads me to the query: "What right have we to leave in the human body any substance which requires that we also seal in contact

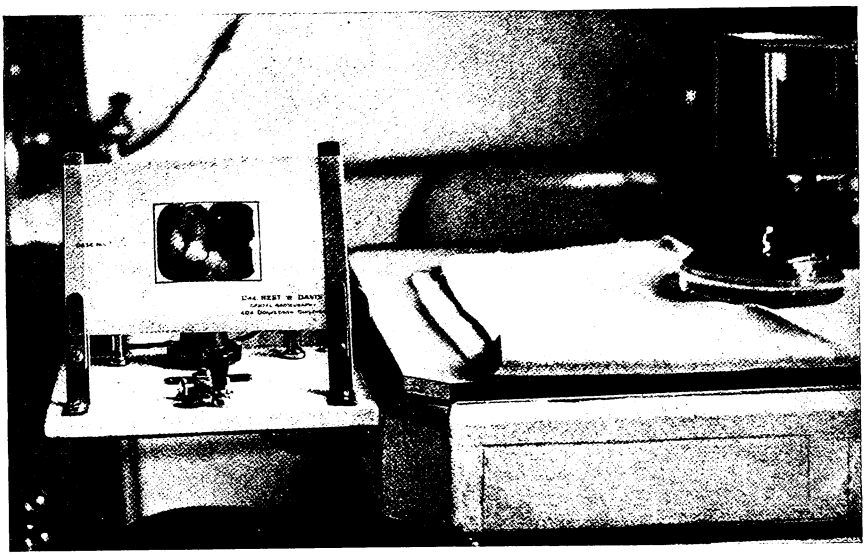


Fig. 7. Illuminator.

with it a germicide to control the action of bacteria which we fear may be present?" Prinz and Buckley have drawn our attention to the fact that there is no such thing as a permanent germicide which we can seal in a tooth, and our experience in examining thirty cases shows that in every case where non-vital tissue was present bacteria existed regardless of the preparation that had been sealed in the tooth.

Before discussing the technic of this operation let us for a moment consider some of the instruments and equipment necessary for this work.

Apparatus and Instruments Used in Root Work.

First we must have a good sterilizer, for much of our equipment must be boiled before and after each operation. Then comes the dressing sterilizer for the sterilization of the cotton canal points, the dressing bristles, gauze pledgets, cotton pellets, napkins, gauze sponges, etc. (Figs. 1 and 2). Then we have a small bur

*For opposite views on this subject see article by Dr. C. Edmund Kells in this issue, page 481.

Fig. 9.

Case I.

Fig. 8.

and broach sterilizer. Dr. Otteson of Christiana, Norway, who was in this country recently, gave me the idea for this little outfit, and though I could not get the one which he was using, I made up one which suits me so well that I could not get along without it. I selected a four-inch electric stove and placed around it a two-inch brass collar. Inside the collar was placed a four-inch porcelain cup. When the brass collar was

Fig. 11.

Fig. 10.

Case II.

Fig. 12.

nickel plated it made quite an attractive little outfit, and being small it can occupy a place on the bracket (Fig. 3).

The dressing bristles, of which one should have three or four dozen, are made of metal which will not rust and are set in aluminum handles. The bristles are wrapped with cotton and in lots of six are placed in a wrapper made of linen, each lot being separately wrapped in a six-inch square of gauze (Fig. 4). The cotton canal points are folded up in lots of six in the same style of gauze, also the cotton pellets, which can be purchased in quantities already rolled, are made up in small packages of from twelve to twenty pellets in a package (Fig. 5). Then we have the gauze pledgets which are six by six pieces of gauze, folded with one corner turned back.

Aseptic Root Operation Described.

Now we will commence to operate, and keep in mind, if you will, that we will now attempt to do something which has been considered by many rather impracticable in the past, and that is an aseptic pulp canal operation. Spray the mouth, paint the gums in the region of the operation with iodine, being careful to have the gums

dry before applying it. Now adjust the rubber dam with a rubber dam holder which can be sterilized (Fig. 6). When adjusted, paint the teeth included and the dam surrounding the teeth with iodine, then alcohol.

We will assume that we are operating on a tooth that has a large cavity and the pulp is so involved that it can not be saved. We have injected our anesthetic and will work without having to contend with

Fig. 13. Case III.

pieces of vital tissue in the canals which has proven annoying on so many occasions. Carefully remove all the decay and sterilize the cavity with iodine. With a pulp chamber bur, which has just been taken from our bur and broach sterilizer, we open the pulp chamber, freely exposing to full view and access all the canals.

Now we will select what we consider a difficult canal to open. Take a very fine smooth bristle and gently force it into the canal; very gently and patiently work it along the canal toward the apex. If it buckles or turns on itself try another, and yet another, and if they fail, try an extra fine spiral broach which is much more rigid. With either one or the other we can, in most cases, reach the apex, and if we can the success of the mechanical part of our operation is almost certain, for we now operate from the apex back.

We are now operating with a radiograph of the case on our bracket

Fig. 14.

Fig. 15.

Fig. 16.

Fig. 17.

Fig. 18.

Fig. 19.

Case III. Checked up with small films.

in a small illuminator (Fig. 7), and know approximately the length of the root. When we have reached approximately the apex with the bristle and it is a very tight canal, we place a small drop of fifty per cent. sulfuric acid on the bristle, and by moving the handle in a sweeping motion we carry the acid to the end of the bristle and push back the walls of the canal. This is continued until the bristle moves back and forth easily in the canal. It is now removed and bicarbonate of soda introduced. When the reaction has subsided the moisture is absorbed as well as possible and a spiral broach is introduced. This is worked into the canal and each time it is turned in the direction of its thread it must be pulled back. This accomplishes two things: it prevents the instrument from becoming wedged and breaking off in the canal, and also is the means of cutting down the walls. This process is kept up until we near the apex, when we substitute the files which are somewhat similar to the spiral broaches, but have a much closer spiral and have a sharp cutting edge, which is turned out so that when the instrument is placed in the canal and drawn out it cuts down the wall of the canal. We keep increasing the size of the instrument until we have the canal sufficiently enlarged, when we place a sterile measurement wire in the canal and bend it through a groove which we have cut in the margin of the cavity over the opening into the canal, seal the tooth and have it rayed.

When the film is ready, which is about the time it takes the patient to get back to the chair and have the rubber dam adjusted, we remove the measurement wire and place it on the film to see if there is any distortion. If not, we note on the patient's chart the exact length of the root. This is for future reference in case a post is inserted for bridge abutment. In case we have not reached the apex sodium-potassium may also be used on a very fine broach and an effort made to penetrate farther. Get as far as possible with this and then use sulfuric acid as suggested by Dr. Callahan. I have recently found a sulfuric paste which can be carried into a canal on a broach almost as readily as the sodium-potassium. If it is a curved canal we must depend upon our ability to work around the curve with a bristle and the chemical or cut back the walls of the canal as Drs. Callahan and Rhein have suggested, then continuing into the canal. If it is a straight root we can also make excellent progress with a set of instruments, which I think are without a name as I understand there are only a few in existence.

It is one of the most ingenious devices I have ever seen. It consists of a set of drills, which come in dozen lots and which fit into a small mandrel for the hand piece and also the right angle. It is about the only drill I have ever seen that I could feel any degree of comfort in using in the canal when using the engine. If it is considered advisable

not to use the engine, which I think is generally the case, we have a handle which is quite heavy and affords a good grip. The small mandrels fit into this handle and we can use them in this way. The little drills are so constructed that they have one weak point, and before they will stand enough pressure to break near the apex they will come apart where they enter the mandrel. The Downie and Kerr reamers, of course, have their place at this stage of the operation.

Now we assume that we have at last reached the apex. The case is again rayed with measurement wire, and we are now ready for the filling of the canals. This I am now doing as has been advocated by Dr. Callahan, to whom so much credit is due for the work he has done in this line. And when I say this, I cannot do so without at the same time paying a tribute to the men here in New York.

Our solution of chloroform and rosin is placed in the canal and a cone selected from its bath of alcohol. The cone is pumped up and down in the canal until it is entirely dissolved. The canal is filled about three-fourths full, the remainder is filled with oxychloride of zinc cement. The case is again radiographed and, if satisfactory, we can give a sigh of relief and feel that again we have done a real service for humanity. It has been hard work and in the case of the molar has consumed not a half hour, but more likely four or five hours.

In closing let me repeat one idea expressed earlier in the paper. No longer can it be said that simply because we do not have the symptoms of acute septic pericementitis or the establishment of a fistula that, that particular pulpless tooth is not giving the patient very serious trouble, or that it is not rapidly becoming the seat of very serious trouble later on. What we do not know for a fact we must not state as a fact. Having assumed the responsibility which our patients place upon us in this operation, let us do it in a manner which will not reflect upon our ability.*

Case Histories.

Case I. Where there is a history of systemic disturbance and dental origin is suspected, but no teeth giving trouble, it will be desirable at time to use large plates, taking a picture of each side of the jaw, as shown in Figs. 8 and 9, which are radiographs of the right and left side of the same patient.

In Fig. 8 we observe a suspicious condition of the second upper bicuspid, and in Fig. 9 there is an abscessed root on the first upper molar and imperfect root filling in the second lower bicuspid. These three teeth, therefore, should be radiographed with dental films in the mouth to obtain better records of the real condition of the periapical region.

*Dr. E. A. Woodworth, bacteriologist, has furnished valuable material for this paper.

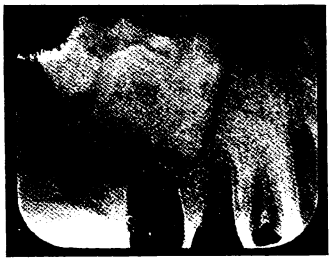


Fig. 20.

Fig. 21.

Fig. 22.
Case IV.

Fig. 23.

Fig. 24.

Fig. 25.
Case V.

Case II.

Fig. 10 shows a fistula opening on the chin which was attributed to an abscess at the end of a lower central incisor.

Fig 11. The lower incisor, in which, oddly enough, we find two root canals.

Fig. 12 shows the case after root amputation and root canal filling. The shadow below the root is caused by a dressing.

Case III.

Fig. 13, large film showing general view of upper teeth.

Fig. 14, same case, small dental film, showing rarefied areas above the cuspid, second bicuspid, first and second molars.

Fig. 26.

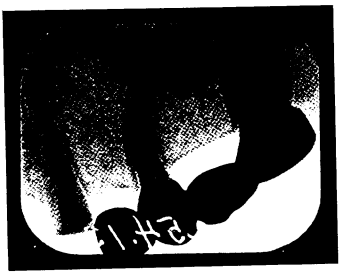


Fig. 27.

Fig. 28.

Fig. 29.

Cases VI, VII, VIII and IX.

Fig. 15, same case, small dental film, showing improper root fillings and rarefied areas above first and second bicuspids.

Fig. 16, same case, dental film showing lack of root filling in second molar, right side below, causing rarefaction.

Fig. 17, same case, dental film, showing improper root filling in second lower left bicuspid.

Fig. 18, dental film showing improper root filling in first and second left lower molars with rarefaction and root absorption.

Fig. 19, dental film taken to examine conditions under left lower cuspid and bicuspids. Tissues found to be normal.

Case IV. Fig. 20 shows incorrect root fillings and rarefactions about first upper bicuspid and first upper molar.

Fig. 21, same case, with roots filled. As it was impossible to reach the apex of the mesial buccal root of the molar, the end of this root was amputated, Fig. 22.

Case V. Fig. 23 shows incorrect root fillings in teeth used as abutments for a bridge.

Fig. 24, same, after correct root filling.

Fig. 25, same case, correct root fillings in upper molar on the opposite side.

Case VI. Fig. 26, canal filled in upper right second bicuspid with measurement wire in molar.

Case VII. Fig. 27, correct root filling in upper right cuspid.

Case VIII. Fig. 28, root filling in lower molar.

Case IX. Fig. 29, root filling in upper right bicuspid and first molar.

Bibliography.

Burchard and Inglis—Dental Pathology and Therapeutics.

Noyes—Dental Histology and Embryology.

Buckley—Dental Review, August, 1911.

A. M. A. Journal, Vol. 63, Number 23.

Shenton—Diseases in Bone.

Bythell and Barclay—X-Ray Diagnosis and Treatment.

Sturridge—Dental Electro-Therapeutics.

Callahan—Journal of Allied Dental Societies, Mar., 1914.

Evans—Cosmos, 1893.

Adami—Pathology.

Journal of Infectious Diseases, Vol. 14, No. 1.

G. V. Black—Personal Communication.

Fischer—Local Anesthesis in Dentistry.

Kerr—Surgery.

Raper—Elementary and Dental Radiography.

Pickerill—Stomatology in General Practice.

Buckley—Modern Dental Materia Medica, Pharmacology and Therapeutics.

Prinz—Dental Materia Medica and Therapeutics.

Blair—Surgery and Diseases of the Mouth and Jaws.

Rhein—Items of Interest, 1909 (Aug.).

Ottolengui—Items of Interest, Sept., 1914.

Buckley—Items of Interest, April, 1910.

American Society of Orthodontists.

Discussion on the Paper of Dr. Kemple.*

Dr. H. A. Pullen, Buffalo.

The concluding paragraphs of Dr. Kemple's paper, in which he states that the fewer and simpler the appliances and the shorter time they are on the teeth the better, presents ideas of rational treatment with which we can all agree, but the essayist has so modified his more radical assertion as to the age when treatment should be begun, and as to the extent of the influence of such treatment, that when I think I have found a point of disagreement in part of the paper I am confronted by a preceding or succeeding modification of the point on which we might disagree.

As to the proper age for treatment, the essayist prefers the age of nine or ten, but admits that "no fixed rule can be made which will be a safe one to follow in all, or even in the majority of cases."

If I were to take a census of the average age of the patients in the practice of orthodontists generally, I believe that the age of nine or ten would be found to be the prevailing average. I am more than willing to agree that the infant in arms of two, three or four years of age is too young to treat except in cases complicated by bad habits of thumb-sucking and mouth-breathing, etc., where perhaps some mechanical work is necessary to assist in breaking up these habits. There is a very good reason for not attempting to develop a dental arch at the age of two or

*Dr. Kemple's paper appeared in the June issue.—EDITOR.

three, and that is, that the artificial stimulus of treatment is unaided by Nature, the period of most rapid growth not supervening until within a few months preceding the eruption of the central incisors. In a two-year-old child there is nothing to develop, so to speak, but there may be malocclusion which ought to be corrected before six years of age.

For example, if a Class 1 malocclusion of the deciduous teeth presents with one upper half of the arch in lingual occlusion, the widening or expansion of the upper arch unilaterally before the eruption of the first permanent molars or the upper incisors appears to be rational and admirable treatment, more in the nature of preventive treatment, as it were. By such treatment the arrested development is corrected and normal development initiated, so that there is a better opportunity for Nature as an orthodontist to do her work. In other words, Nature as an orthodontist cannot begin until this kind of malocclusion is corrected, and if not corrected, Nature is helpless to prevent more serious malocclusion in the crowding of incisors and lack of lateral development, etc., which ensues.

Another example of wise early interference, as it has been called, would be in a Class 3 deciduous malocclusion. From my experience in these cases at five or five and one-half, I believe that the restoration of normal mesiodistal relations of occlusion also gives Nature the best chance for normal development, which opportunity, if missed by advising later treatment at ten years, allows five years of abnormal development of the dental arch and maxillary arch and of the facial muscles which are likewise affected.

Class 2 cases, I believe, will respond to such development better if begun after the eruption of the first permanent molars, and upper central and lateral incisors, but even in these cases I believe that eight years of age is not too early for treatment. Early treatment and control of the developing dental arches in these cases would seem to be our only hope of final retention.

In regard to the malocclusion of individual teeth, torso-occlusion of recently erupted permanent teeth also seems to call for immediate treatment, as their retention is more permanent in every case than if allowed to continue long in torso-occlusion.

Influence of Treatment on Associated Structures.

The paper strikes a hard blow at all of the newer theories in regard to the influence of treatment of malocclusion and development of the dental arches upon the growth of the directly and indirectly associated structures of the internal face. The essayist states that these theories are "purely presumptive," that they are statements of what we would like to believe might take place.

I do not believe that the essayist would like us to believe that these theories are simply "scientific imagery," or products of the imagination alone. There is always another side to every question. In other words, every theory is debatable. The other side of this question under consideration is debatable as well, whether we arrive at any absolutely proven conclusion or not. We must have certain workable and tenable theories in orthodontia, even though some of these theories are difficult to demonstrate as facts. One of these theories which the essayist especially ridicules is the influence that treatment of malocclusion may have in stimulating development of regions closely associated with the alveolar process, or as remote as the antral sinus, the sella turcica, the seat of the pituitary body.

I do not think that this theory of development of associated structures through orthodontic treatment is so hard to believe. The essayist has not presented any arguments against the support of this theory. It seems to me that we have macroscopic if not microscopic evidence of the growth induced by orthodontic treatment. Impacted teeth erupt quickly many times when freed from pressure, and the developmental area surrounding them is stimulated by treatment. The beneficial results to the nasal regions, while not evident from the appearance of the structures, exhibits often such restoration of normal function as is clearly noted.

There is as much reason to believe in the increased development of the nasal regions as a result of orthodontic treatment as there is reason to doubt it. The only facts with which the essayist attempts to overthrow this theory are the measurements of some skulls which vary in the relative proportions of the dental arches, nasal sinuses, etc., and in view of the fact that these skulls were perhaps not typical of the general average, I do not believe the measurements warrant the deduction that the size of the dental arch has nothing to do with the size of development of the nasal spaces and antra.

In support of the theory that dental arch development is related to the development of the superimposed nasal structures, it might be suggested that the interrelationship of function is evidence of at least some interrelationship of structure. If bone grows as a result of mechanical stimuli, and the extent of that development is measured by the stress, than the development of the osseous structures in continuity of the dental arches ought to exhibit some results of the stress of occlusion. If the function of occlusion is increased by orthodontic treatment, the result of increased function ought to influence the growth in the nasal structures in some degree proportionate to the increase of function in the dental arches.

May I ask, "What is the extent of the influence of orthodontic treatment?"

The essayist answers this by saying that the benefits to hundreds of children are seen on every hand. "Behold them and judge for yourselves."

I infer from this that he feels the child is benefitted physically. Can we limit these physical benefits to areas not inclusive of the nasal regions or even the regions higher up in the internal face, which are contiguous in structure to the osseous structures of the jaws. If not, then the influence of treatment of malocclusion must extend to all contiguous tissues, to the dental arches, the nasal regions, and the internal face.

I have no doubt, however, that the caution of the essayist against too early treatment and too long treatment of young children is well advised, and as a general principle I heartily agree with him. As to the extent of the beneficial influence of dental arch development, I do not believe we have as yet overshot the mark in our theories of the extent of that influence, although they cannot be always proven.

Dr. Milton T. Watson, Detroit.

I want to congratulate the essayist on having the courage of his convictions, though his attitude on this subject is somewhat more pronounced than my own. If we would print one particular paragraph of his paper in italics, I would be quite willing to simply endorse the paper and let it pass, hoping by this means to tone down the few radical ones and trust the others to take care of themselves. The particular paragraph referred to is the one in which he says: "I do not believe that any fixed rule can be made which will be a safe guide to follow in all, or even in the majority of cases. Conservative judgment, based on careful observation and experience, must always be the safest foundation upon which to place our decision." This paragraph states an axiomatic truth, and yet gives us sufficient latitude, so that any one of experience who has studied this problem carefully may feel that he is still well within the bounds of reason and good practice, even though he may occasionally treat little four or five-year-old children, as Dr. Kemple does himself sometimes.

As Dr. Kemple has told you, orthodontia has gone through exactly the same experience that every other branch of the healing art has, namely, going from one wild extreme to another. This all leads to the conclusion that years of experience and intelligent observation is most essential, if we wish to avoid serious mistakes, and that we are all dependent, in a large measure, upon the observations and deductions of all intelligent and reliable operators who have preceded us.

I have been greatly interested in this particular subject for years, and it was not until after careful observation of a large number of cases that I came to any definite conclusion in regard to the need for ortho-

dontic interference in children as young as four or five years of age. I have histories of some of these cases running back ten years or more, and of the cases that I have been able to keep track of, every child—of otherwise average development—who showed utter lack of increasing development in the temporary arches at five years of age, either required subsequent treatment or now has malocclusion.

I am firmly of the opinion that all Class II and Class III cases should be put under treatment as early as it is possible to handle the child with a reasonable degree of comfort, which usually will not be earlier than four years of age. I do not, however, believe that this will, in the majority of cases, entirely prevent malocclusion in the permanent denture, but it still has many advantages by way of lessening the degree of the future malocclusion and in balancing the development of the external face as well as the deeper structures, to say nothing of the effect on the masticating efficiency and the respiration. I believe it to be clearly our duty to advise treatment of young children, rather than to wait until a later time in all cases where there is a *well-marked* insufficient development, and especially if the structures under consideration show a tendency to much slower growth than the other structures of the body. Every one of us has doubtless had the experience of treating simple cases belonging to Class I, where they came under observation just about the time the temporary molars were being lost, and within a comparatively few months we have been able to establish eminently satisfactory occlusal relations, which we have been able to maintain with comparative ease, but it is equally true , on the other hand, that a large percentage of the cases belonging to Class I, which are allowed to go without attention until eight or ten years of age, show such a marked elongation of the incisors, as compared with the molars, that the treatment is decidedly more complicated, and the satisfactory retention of such a case infinitely more difficult, with a much greater chance of a result only partially satisfactory; therefore, good judgment must, after all, be our guiding influence.

Cases from Practice.

As a matter of curiosity, I have carefully gone over twenty-five cases, taking them just as the models appear in my cabinet, the oldest of whom is eleven and one-half, with the following result:

In seven of these cases, belonging to Class I, the lower incisors were striking the gums just back of the upper incisors, and in several of the cases to such an extent that the treatment is much more difficult. These seven cases were respectively seven and one-half, eight and one-half, seven, eight, eight and one-half, ten, and eight and one-half years of age. Another case, eleven and one-half years of age, belonging to the

Second Division of Class II, shows such a marked elongation of the anterior teeth that I have very frankly told the parents that I do not expect a result that will be entirely pleasing from an aesthetic point of view. There are among these twenty-five cases two belonging to the First Division of Class II, one four years of age and the other four and three-quarters, one of which already shows an excessive supra-occlusion of the lower incisors.

I am firmly convinced that the cases belonging to Class I, where treatment has become complicated by inharmony in the degree of eruption of the anterior and posterior teeth, and which represent nearly one-third of the cases mentioned, would have been handled much more easily if the treatment had been started at an earlier age, and that the degree of success attained would have been more satisfactory. My own experience, however, leads me to the conclusion that it is only rarely indeed that a child under four years of age can be successfully managed, and that it is not always the part of wisdom to start the treatment even then, notwithstanding the fact that the case clearly requires orthodontic interference.

I feel that the essayist is a bit pessimistic when he says: "We do not know that the bony structures which underlie the alveolar process are stimulated to any greater or better development through orthodontic measures than they would be without it." We certainly have most convincing evidence that the lack of occlusion and of the stimulating influence which it exerts does interfere to a marked degree with the development of the true bone, as shown by the experiments of Dr. Lawrence Baker, as reported to this society some years ago. If the mechanical destruction of the natural stimulating influence has such an apparent effect, what other conclusion can you possibly draw than that to supply, mechanically, a somewhat similar stimulation, where the natural forces are lacking, will have its effect on the same structures? At any rate, until positive evidence to the contrary is shown, I believe we should be guided by such apparently strong evidence.

Relation of Oral and Nasal Spaces.

That the proof of an actual enlargement of the nasal spaces through widening the upper arches is not conclusive, is, of course, the opinion of many men, though we all agree that normal respiration is improved in the majority of such cases, and this being true, it is certainly logical to do the operation as early as possible, for no one, so far as I know, doubts that the performance of its normal function is essential to the highest development of any organ. Is it not also true that in overwhelming numbers we do find a rather definite relation between the oral capacity and the breathing capacity, though the

shape of the nasal spaces may vary greatly, being either wide and not very high or narrow and much higher?

Any child who shows a marked furrow or crease in his tongue, where it folds upon itself for lack of room, needs to have his oral space enlarged, in my judgment, regardless of age, and when it is done his breathing will usually improve, and it is not of prime importance whether this improvement is all due to providing a place for the tongue, so that it is not crowded back into the naso-pharynx, or whether a part of the improvement is due to an actual increased growth in the nasal spaces. In fact, it is quite possible that Nature will determine this point for herself as soon as she is relieved of the original handicap.

If it could be proven conclusively that just as good results can be obtained by delaying treatment until eight or ten years of age, I would be delighted, for it would certainly confine our responsibility to a much shorter time, and would relieve us of the burden of overcoming the extreme timidity which is so often present in the beginning with four or five-year-old patients. I must say, however, that it has only been on the rarest occasions and in the very simplest cases that I have been able to give a patient final dismissal in two years, which Dr. Kemple mentions as the minimum time required for some of these delayed cases.

Many conditions are self-corrective, and in such, interference should, of course, be studiously avoided. My chief criticism of this paper is that the casual reader will be led to draw a false impression in regard to the class of cases where such conditions really exist. I am, however, in perfect accord with Dr. Kemple when he warns against the "early treatment doctrine" as a positive rule for all cases.

Dr. C. A. Hawley, Washington, D. C.

This is an extremely valuable paper, and the conclusions drawn by the author are worthy of careful study and thought. I think the time has arrived for us to draw more carefully the lines and know more of the conditions under which we should commence early treatment and when we should not. Dr. Kemple has, I think, carefully drawn those lines. If you begin the practice of orthodontia with unbounded enthusiasm, with the idea of treating every case that shows a departure from the normal immediately, you will soon realize that this is a view from which you must recede. The cases must be very carefully considered.

I do not want to repeat the discussion that has already taken place, but to consider the matter from the viewpoint of the question as to how much treatment will interfere with the normal function of the child's teeth. If we start the case at five or six years of age, we must continue the treatment of the case in some form, with appliances or retention, and

have some appliance on the child's mouth for five or six years. This interferes with the function of mastication. Of course, it depends somewhat upon the skill of the operator. If an operator is able to so carefully fit his appliance and so carefully continue treatment that the function of mastication and normal development is not interfered with, well and good. But there are cases in which the appliances are irritating and where they continue to interfere with the function of mastication, the cleansing of the teeth, and what normal development there would be.

What is normal in a child at different ages and what is abnormal, I think has not yet been carefully determined, that is, as regards development in the width and forward movement of the arch. We know that distocculsion is not normal, nor is mesiocclusion normal, but just how we can judge the state of development at different ages has not been determined.

Examination of Child Skulls.

I have been interested in the last two weeks in examining a number of skulls of Indian children, and have found some things that I did not expect. I think you will remember I showed you several years ago at Denver some slides of cases of children who had come to my office at different ages and not received treatment. For example, one at four, some at six, some at eight, some at ten, and some at nine. These children had not received treatment. Comparison of the same arches at different ages disclosed the fact that there was no development. I examined the other day something like eighty skulls of children under the age of twelve. They were Indians, Mexicans, and some Esquimaux, all people in a primitive state. I took my charts as standard of development in the examination of the skulls. The width of the arches in children under five years of age was considerably below the normal. I took the measurement of the second deciduous molar and compared it with the second bicuspid of the permanent arch chart. I found seventeen children under five years of age, and all of them were from that standpoint underdeveloped, and not very different from the civilized children who come to us to be treated. I did not find nearly as much space between the anterior teeth as I would have expected. That is difficult to determine, because most of the incisor teeth have been lost from the skull on account of the conical shape of the roots. From the age of six to twelve I found nearly fifty, and as near as I can determine you can call practically every one of them normal across the first molar, indicating that from the age of five to ten and twelve there had been great development, far more development than in our children. I noticed also that the cusps of the temporary teeth were worn absolutely flat, and many of them half way to the gums, and we could fairly draw the conclusion that the development was due to use in mastication.

Coming back to the question of treatment, I think we ought to take into consideration in using an appliance how much we are going to interfere with the function of mastication. I agree largely with Dr. Kemple that many of these cases by poor judgment can be overtreated. We may leave an appliance on for too long a time. We may interfere too much with mastication, the very function we should try to stimulate and the function which seems to be the cause of development in the arches of primitive races. In the matter of simple underdevelopment it is a question whether some of these cases would not do just as well if we let the children go until they were ten years of age, provided the function of mastication were properly exercised.

Dr. R. Ottolengui. I would like to ask Dr. Hawley how he determined the age of these skulls?

Dr. Hawley. I judged those under six by the fact that the first molars were not erupted. We have to keep in mind all the time that the Indian child erupts its teeth earlier than the white child. I could see permanent molars in the crypts, but unerupted. In the same way I judged the age from the loss of the other teeth and position of the second molars, the second molars erupting near eleven and twelve. You can make a fair guess in that way.

Dr. Wm. C. Watson. I want to emphasize one point Dr. Hawley has brought out, because it is the most important thing that has been said in connection with the discussion of this subject, and that is in regard to the stimulating influences of the natural use of the teeth. I think the slides of many of the children who apparently require treatment show that they would get along nicely without treatment if there were a possible way to induce vigorous exercise of the jaws. I believe lack of jaw exercise to be one of the predominating evil influences in the production of malocclusion.

Dr. J. Lowe Young, New York City. I would like to compliment the essayist on his paper, and particularly on his courage to come out as he has in the open. Let me call your attention to one point that has not been touched on; if it was, I did not catch it, and that is what takes place when we move a tooth. To move a fully erupted tooth we cause resorption of bone on one side, and this bone must be re-formed or built up in order to have the tooth remain in its new position.

Nature's way of building bone is so difficult to understand that it is very, very doubtful if we ever move teeth slowly enough to harmonize with Nature's laws.

As the roots of the deciduous teeth are resorbed, the bone surrounding them is also resorbed, and as the permanent tooth erupts, new bone is

also built up to support it. Is it not logical that a tooth guided to its proper position during the period of eruption is far more liable to remain in this position and have bone developed in a more physological manner than if allowed to erupt into a malposition and then be moved? This is the reason why I am very much in favor of early interference in these cases.

Since I have been using the new Angle appliance I have studiously avoided attaching the arch wire to an erupting tooth with a pin. In many cases I have been able by means of delicate springs attached to the arch wire and extending lingually to the erupting tooth to guide it into its proper position and not interfere with the natural process of eruption, or at least to a very slight degree.

What I said last year was that I did not think there was any mechanical appliance ever devised which would move a tooth exactly as Nature does it during the process of eruption, but the nearer we come to Nature's way of moving a tooth, I believe, the better.

Dr. Federspiel. Why not let Nature do it?

Dr. Young. If she will do it, let her, by all means.

Another point I wish to speak about is the wearing of appliances during the entire period of eruption of the teeth when treating young patients. In my judgment, it would be folly to have a child wear appliances during all this period. I would advise expanding of the deciduous dental arches sufficient to accommodate the four incisors, and after their eruption all appliances may be removed from the mouth until the teeth that replace the remaining deciduous teeth begin to erupt. If these start in malposition, I would then use some simple appliance so as to guide these teeth into their proper positions during the period of eruption. This particularly applies to teeth requiring rotation.

Bicuspid teeth can be banded without any annoyance to the patient, just as they peek through the gum, and at this stage of eruption can be rotated in a few weeks, and after three months retention may be liberated.

This method of treatment necessitates more appliances than if the child were allowed to wait until he was ten years of age, but the satisfaction of knowing that the teeth will remain in their proper position after the full compliment of permanent teeth have erupted, except the third molars, more than compensates for the extra time spent in making appliances.

My best results have all been in cases I have treated early in life.

I would like to say a few words on this subject.

Dr. U. H. Jackson, New York City. I recommend placing all teeth in proper position while erupting or as soon thereafter as practicable.

That statement I made several years ago. Dr. Guilford included it in his text-book. I have been an earnest advocate of the early regulation of the teeth for many years. An apparatus can be constructed so that no especial discomfort or pain should be caused the patient from its use.

Finally I planned and have employed a permanent record system and an apparatus governing the exact amount of force applied at each visit, usually at intervals of once a week. I have a young patient in whose case there is a considerable amount of space between the upper deciduous incisors and the lower ones, the upper arch protruding very much. Shall we not begin to treat these cases as early as possible with a suitable appliance, getting the tissues equalized and functionating so that Nature will build the necessary tissue into a normal form while the arches are in their most active developmental stage? If so, how long should the appliance be kept in place? I would reply, continue the treatment just as long as is necessary to permanently correct the condition. Continue the treatment with the child just as one would in treating an adult, even though it is sometimes necessary to continue the treatment a considerable length of time. We generally get better results from early treatment, and it is necessary that we do the best for our patient, regardless of the length of time consumed.

I am presenting models here of a case of a child four years old, with narrow arches and distal occlusion, which illustrates some of the conditions we have mentioned.

No organ of the body will properly develop unless it is functionating. A delay in regulating often encourages nasal obstruction.

If a child's lips do not close properly, and there is protrusion of the upper incisors, a serious condition of the occlusion will usually be brought about if neglected for two or three years.

We should correct these conditions early, causing the lips to close normally and know that the nose is functioning properly, that is, being employed rather than the mouth for breathing.

At the clinic here I showed the models of a case of a child four years old, having lack of lateral harmony of the arches, where, I am sure, if it were our child we would not be willing to delay its correction.

Impacted Molars.

We had a beautiful illustration of an impacted third molar, shown and described by Dr. Ottolengui.

Although the subject is not now before us as to how we should treat impacted molars, I will make a few remarks regarding it. We need not follow the old practice of the general practitioner of dentistry in extracting all impacted third molars; it is our work as orthodontists to save these teeth. We go to college to learn how to save teeth. Of course, if the position of the third molar

cannot be corrected, it should be extracted, but we should relieve the impacted molar by orthodontic methods, tipping the molar to an upright position. I shall be glad at some time to go over that matter and tell you what I am doing. I am saving these third molars in almost every case. Where one is so deeply imbedded in the bone back of the second molar that Nature cannot force it to proper position, we need not always necessarily resort to general surgery for its removal, but it is our duty to save the molar by forcing distally on the crown to dislodge it, and at the same time control congestion by proper medication. It is unreasonable to say that an impacted molar of a patient, eighteen years of age, should so generally be extracted. The third molar does not normally erupt until the age of eighteen to twenty-one. Why should the profession be so active in removing these teeth, especially before the jaw has reached its maximum adult dimensions? The treatment amounts to the controlling of the swelling with antiseptic applications, and tipping the molar backward.

When there is swelling, one can readily get rid of the swelling and infection by forcing iodine with iodoform crystals freely under the gum into all pockets. This is usually accomplished in the ordinary case by the use of a small curved probe with cotton wound about it, and moistened, picking up a quantity of iodoform crystals, dropping iodine on the dressing by a drop bottle, and forcing the probe under the gum around the tooth, reaching into every pocket as far as may be. This lessens the swelling and permits the ordinary absorption of the tissues to go on without the danger of infection. If the third molar through its abnormal position has become firmly locked with the adjoining molar, the bony and soft tissues can be dressed away from over the enamel portions and at the same time force be applied for its correction. The molar can be first wedged from the adjoining one and when necessary an apparatus with a metal finger be applied for forcing the molar backward sufficiently to dislodge it. I have accomplished this with springs of different forms. A simple method is illustrated in my *"Orthodontia and Orthopedia of the Face,"* page 413, Fig. 484.

Other methods I have employed I shall soon describe.

Dr. George B. Palmer, New York City.

I just want to say a word in connection with Dr. Kemple's paper which came forcibly to me while he was reading it. When I started in orthodontia I began with great enthusiasm to treat everything in sight. I would treat cases four or five years of age when I could get them. I soon concluded to treat nothing until the first permanent molar had erupted, and about four years ago in speaking with Dr. Kemple about one case he said he would not think of treating it if it occurred in

his practice. However, I treated the case, which was one Dr. Kemple showed this afternoon. The patient was five or six years of age, and would have been better off if I had left the case alone. So I honestly believe that in the great majority of cases these patients are much better off at eight or nine years of age than where we treat the deciduous teeth.

Dr. Kemple.

There is little that I can add in closing this discussion. .I fully recognize the fact that it is more important to guide an erupting tooth into its proper position than to allow it to erupt into a serious malposition; but the point that I wish to make is simply this: Are you *sure* that the tooth will be in serious malposition when it is fully erupted?

Probably any orthodontist would have treated the first case shown on the screen at seven and a half years of age—I am frank to say that I would have treated it myself—and yet in a little over two years, without any treatment whatever, the teeth are in splendid position, this result being better than could possibly have been obtained by any kind of orthodontic interference. It is better because it came about through a perfectly natural development, and there is no probability of the teeth "going back."

If a child is suffering from nervous strain because of impaction and crowding of the teeth, it should be relieved. But not all cases of apparent malocclusion at six or seven years of age are suffering nervous strain, or any other kind of strain, from impaction. A very small per cent. of the cases that are treated at this early age are treated because of nerve strain; they are treated early because the idea has gone abroad that every case must be treated early, at the first symptom of malocclusion. In one case shown, treatment was advised at three, at six and at seven years of age, by three different orthodontists. The parents neglected to have the work done, and now at ten years of age, without having had any orthodontic treatment whatever, these teeth are in almost perfect normal position. I do not believe any of us could have obtained better result than Nature has accomplished in this instance. I am heartily in favor of treating every case that really needs treatment, but I am strongly opposed to treating any case that does not need it. I have no definite rule for these young cases, but I am learning every day to have a greater respect for Nature's method if she is given half a chance to do her work.

Central Dental Association of Northern New Jersey.

A regular monthly meeting of the Central Dental Association of Northern New Jersey was held at Achtel-Stetter's, Newark, N. J., on Monday, April 20, 1914, at eight o'clock P. M. President Fowler called the meeting to order.

A quorum being present, the roll call was, on motion, dispensed with.

The Secretary read the minutes of the last meeting which were approved as read.

President Fowler introduced Byron C. Darling, M.D., of New York City, who read a paper published in this issue.

President Fowler. You have heard this very entertaining and instructive talk by Dr. Darling. It goes to prove that the dental profession is very closely allied to the medical, and it behooves the members of our society to look further into the causes of the diseases of our patients than is ordinarily done.

I wish to speak of another matter for a moment before taking up the discussion. At a recent meeting of our Executive Committee it was decided that we hold a joint meeting with the Tri-County Society, June 17th, I think it is. There has been a committee from among our members appointed and Dr. Nuffort, the Chairman, will look into the details of the athletic features and so on, and the Secretary will also be connected with the committee.

At a recent meeting of the Academy of Medicine the dentists of this section were granted the privilege of becoming members. I understand this opportunity has not been improved by many as yet, which probably has been due to oversight. Dr. Hané has with him to-night a number of applications, and those of you who would be interested along that line would probably do well to consult him. We will now proceed with the discussion.

Discussion of Dr. Darling's Paper.

R. D. Baker, M.D.

I would like to divide this subject into two classes; that is, infection by direct absorption from the mouth and infection by the indirect method, by way of the intestinal tract.

The infections by direct absorption are evidenced most frequently by chronic joint conditions and mild septic states. These conditions have been very much improved or cured by the removal of the acute infective process. They have also been improved by the use of vaccines. In speaking of indirect infection by way of the intestinal tract we might say, in the first place, that the mouth is a good incubator. Anærobic conditions are furnished by the inside of food particles and by decaying teeth. The ordinary mouth flora are not pathogenic, but many pathogenic organisms do enter the mouth with food and other objects, and they are mostly of the pathogenic streptococcic or staphylococcic families. If the mouth is dirty, if it is allowed to retain food particles, or if some special focus of infection be present, as you have seen in the pictures to-night, many organisms are fed into the stomach. The stomach of normal activity and normal secretions will kill a very large number of organisms. Spores are not so readily cared for, and as time goes on spores and some organisms make entry into the intestinal tract. In the lower ilium those able to grow in a slightly acid medium begin to develop. In the cæcum conditions are more favorable to their growth. Movement of the fecal mass is slow, moisture is sufficient and the reaction is alkaline. Here is the beginning of the putrefactive state. It is a long continuance of this excessive putrefactive state which changes the condition of the mucous membrane and makes it possible for organisms to pass through and be carried into the general circulation, where if they are virulent enough they may set up any kind of septic process. The normal bowel wall probably does not allow of the passage of organisms, but there are very few of us who possess, after a few years of life, an absolutely normal bowel wall.

Conditions of ulceration along the intestinal tract may be direct; that is, they may be caused by direct infection of the mucous membrane, or they may be caused indirectly by absorption from the bowel and passage through the blood stream.

Infection by this method may give the same expressions that the more direct method does and would also be responsible for the excessive putrefactive state of the bowel and its manifold expressions.

Dr. Rosenow has connected definite organisms with definite pathologic states—joint infections, heart infections, ulcer of the stomach, nervous lesions. These organisms are found in diseased tonsils, diseased

teeth and in the bowel contents. Surely it is reasonable to connect them in the way that we have.

Joseph Kussy, D.D.S., Newark, N. J.

It is indeed gratifying to have medical men come here from time to time as they have recently done and present such papers as Dr. Darling has offered here to-night, which are of mutual interest to the two professions.

The time is fast approaching when the relationship which exists and should exist between the two professions in the study of pathology and therapeutics of the mouth will be universally established, and the official recognition of this relationship by the Academy of Medicine here admitting us to full fellowship should serve as an inspiration to all of us. The work of Rosenow and others has shown that we are possibly, at least, to blame in our prosthetic work for some of these pathological conditions of the gastro-intestinal tract, which manifest themselves from time to time, and for such local manifestation as arthritis, endocarditis, etc., and I maintain it makes for higher dentistry and for better and more efficient dentistry for us to be thus accused and given a chance to reform.

C. C. Beling, M.D. Newark, N. J.

I certainly did not come here to-night with the idea of being called upon, but I am sure that I have to respond. I am not prepared at all to speak upon this subject, but I will do the best I can.

In my work as a neurologist I have noted frequently enough that there may exist an association between disorders of dental origin and certain diseases of the nervous system. Of these dental conditions, carious teeth and pyorrhea alveolaris, or Riggs' disease, were those commonly observed. It has often occurred to me that this relationship was probably more intimate than we physicians suspected.

For some time past I have been particularly interested in certain types of cases of peripheral origin, in which there was chiefly an affection of the sensory mechanisms of the muscular apparatus and the fibrous tissues in intimate relation with nerves and muscles. They may be largely grouped under the term fibrositis or fibromyositis. They give rise to various neuralgic or neuritic pains and cause more or less intense annoyance and suffering. While we are able to clear them up by local treatment, yet they seem to recur from time to time.

I have been of the opinion that a certain number of these cases at least were due primarily to intestinal conditions, such as Dr. Baker has spoken about. To-night, however, it seems to me that we may have somewhat of a new light thrown upon the subject. It is probable that carious and putrefactive conditions about the teeth, and particularly

disease around the roots of the teeth, may have something to do with their production, either directly or indirectly, through the intestinal disorders initiated by them.

Thus you see that we medical men may learn something from your work. I am sure that I have profited much by being here to-night and hearing Dr. Darling's paper. I am very glad indeed that the Academy of Medicine of Northern New Jersey has recently recognized the dental profession by inviting its members in New Jersey to full fellowship with us, and that we meet you here on an equal plane to-night.

C. F. H. Hane, D.D.S., Jersey City, N. J.

I do not know that I am qualified to discuss the paper that we have heard to-night.

As to infections of the system, wherever they come from, it is gratifying to find ourselves on the road to the final discovery of where these poisonous substances originate.

Our patients have been suffering from all kinds of infections. We have called it poisoning, but we did not know whether it came from fermentation or so-called auto-intoxication. To my mind there is no such thing as auto-intoxication, because that means a poison made by the body itself, but most of these poisons spoken of in the paper are introduced into the system generally through the alimentary canal, or the circulation, from special seats of infection.

Talking about the treatment of these cases by anti-toxins, I had a very unfortunate case recently which may perhaps be interesting, and I would like to get some information myself as to just what the cause was. I have a patient who is a physician and a year ago I treated an upper left lateral for him which was badly abscessed. After two or three months' treatment I finally cleared up the condition and filled the root canal to my satisfaction. Some four or five weeks ago he turned up again with the trouble broken out anew—no opening or discharge, but just soreness and tenderness. I was so sure that my root canal filling had been perfect that I concluded not to remove it but to go at the trouble through the alveolar process. I found pus, a general condition of inflammation, and my gutta percha point penetrating slightly through the foramen. In getting at the history of the case my patient told me that about a week before he had inoculated himself with anti-toxin for typhoid and it was his opinion and mine that the introduction of the anti-toxin had perhaps stirred up latent trouble that had been there, and that originally I had not treated the tooth long enough to get it quite over the original infection. After he had taken this anti-toxin treatment he went to bed with a general fever, his pulse went up to 138 and he was quite a sick man. If Dr. Darling could tell me something about such conditions I would be very grateful to him. (Applause.)

Dr. Darling thanked the gentlemen for their discussion, but had nothing to add.

Dental Hygiene Week and Tooth Brush Day in the Public Schools of New York City.

A movement has been inaugurated in the public schools of New York City which will probably have an incalculable influence upon Boards of Education throughout the country. It is a common experience when a dentist tells a child to clean her teeth three times a day to have the youngster remark, "Can't do it in the middle of the day because I am in school." The writer has frequently argued, therefore, in public society meetings and with members of Boards of Education in this and neighboring States. that the schools might render a valuable service by making the cleaning of the teeth once a day compulsory; but it remained for Dr. C. Ward Crampton, Director of Child Hygiene in the Public Schools of New York City, first to incorporate methods of teaching dental hygiene into the syllabus of the New York Public Schools, and finally to organize a regular cleansing of the teeth by all of the 800,000 school children in New York City. As an initiation of this great movement, one entire week was devoted to giving an impetus to the movement, as will be seen by the report published below and kindly furnished by Dr. Crampton.

The Second District Dental Society deserves particular credit at this time. Through the long and arduous work of Drs. Thaddeus P. Hyatt, A. H. Stevenson and W. H. Rogers, a competent corps of fifty trained lecturers have been giving their services for the last five years, something

like 200 lectures being delivered annually. It happened also quite fortunately that two special classes, one of boys and one of girls, had been regularly taught the tooth brush drills. Thus when Dr. Crampton appealed for assistance, these two expert classes were all ready to pose before the cameras of the Pathé and Universal Film News Bureaus, with the result that motion pictures have been shown all over the United States, exhibiting these children in their drill. These drills had also been taught to teachers and by them to classes in other schools, so that it is not strange that the announcement of "dental hygiene field day" attracted a quicker response in Brooklyn than elsewhere. In Prospect Park, Brooklyn, about 350 children from nine different schools competed for the banner presented by the Second District Dental Society. These park drills were also photographed by the film people and will do much to popularize the idea of clean teeth throughout the United States. The amount of space given up by the daily press of the metropolis to favorable comments on this week's campaign proves that mouth hygiene has at last come to be appreciated as a most important part of general prophylaxis.

The following report of the week, furnished by Dr. C. Ward Crampton, contains many facts which will be of interest to mouth hygiene workers throughout the country:

Dr. Crampton's Report.

A definite campaign, in the nature of a dental hygiene week, was launched to improve the health of public school children, May 24, 1915, and continue for one entire week, ending May 29th. The week was officially designated as "Dental Hygiene Week," and Friday, May 28th, as "Tooth Brush Day." A definite program (attached) was outlined for the week, and included the following:

Talks by Principals in practically every school in the five boroughs.

Lectures by specially trained dental lecturers, members of the First District Dental Society, Second District Dental Society, and the Bronx County Dental Society; 130 lectures were given to thousands of children in all grades, from 1A to 8B, on Tuesday, May 25th, at 9 A. M.

Special meetings for the benefit of teachers, principals and adult high school pupils and others, were held in several of the high schools, namely, the DeWitt Clinton, Morris, Bryant, and the Brooklyn Training School for Teachers. These lectures were accompanied by lantern slides and moving pictures.

Special talks by the class teacher on the care of the teeth, emphasiz-

ing the necessity of periodical visits to the dentist, the necessity of possessing individual tooth brushes, of preserving the first teeth as well as the second set, etc.

Parents' Association and Mothers' Meetings were held in many of the schools. Lecturers were supplied when applications were made for their services. Many of these Parents' and Mothers' Associations held meetings and discussed the subject of oral hygiene among their own members.

Tooth Brush Day. Friday, May 28th, was set aside for the inspection of tooth brushes and the actual demonstration of the tooth brush drill taught earlier in the week. It is estimated that at least 400,000 children brought tooth brushes to school on this day.

Dental Hygiene Field Day. This idea is new in Dental Hygiene Campaigns. The schools were divided in three boroughs, Manhattan, Bronx, Brooklyn, and the Tooth Brush Drill Contests were held on the Sheep Meadow in Central Park, the Parade Grounds in Van Courtland Park, and on Nethermead in Prospect Park.

Because of the strangeness of such an advent, the representation of classes in the parks was only fair. However, more than 550 children took part in the drill. Many of the children were dressed in fancy costumes. The winners in the respective boroughs were P. S. 139, Brooklyn; P. S. 33, the Bronx; P. S. 77, Manhattan.

Moving Pictures. These were taken by many of the motion picture concerns, who are now displaying pictures of the tooth brush drill in the moving picture houses in New York. Later these pictures will be sent all over the country, and it is expected that the idea of a dental hygiene campaign as conducted by our Bureau will be accepted by many other communities.

Co-operation with the Dental Societies. Our Bureau was very ably assisted by the Second District Dental Society, through its President, Dr. William M. Frazer, and its members, most notably, Drs. A. H. Stevenson, Thaddeus P. Hyatt, W. H. Rogers, and R. Ottolengui; by the First District Dental Society, through its President, Dr. Wm. D. Tracy; and by the Bronx County Dental Society, through its President, Dr. Waldo H. Mork. They aided much with advice and information, and it was through its financial support that moving pictures and operators were obtained. "Clean Teeth—Clean Mouths" banners, awarded to the winners of the Tooth Brush Drill, were donated by these societies.

Press. Never before has the daily press been more enthusiastic in commenting so favorably upon a campaign as this one. We were favored by daily press notices numbering in the hundred. Pictures in the dailies of children demonstrating the Tooth Brush Drill, cartoons, editorials, and special interviews, helped popularize the movement among the parents.

Commercial Houses. Many of the dental companies supplied the children with samples of tooth paste and tooth powder. Others contributed literature on oral hygiene. One company has donated a large solid silver loving cup to be awarded through our Bureau to the "public school whose graduating class has made the best showing in oral hygiene for the year." In addition, this company has supplied us with splendid oral hygiene charts, educational have spent large sums of money educating the people through a most in character and free from all advertising material. These companies wonderful system of advertising in the newspapers. Hundreds of the largest drug stores in the city featured Dental Hygiene Week by having large window displays of tooth brushes, tooth paste, mouth washes, etc. With the purchase of a tooth brush, many stores gave away a large tube of tooth paste free of cost. Where the moving pictures of the Tooth Brush Drill were being shown, one dental cream company had men distribute samples of tooth paste and oral hygiene literature to the people as they left the theatre.

Correction.

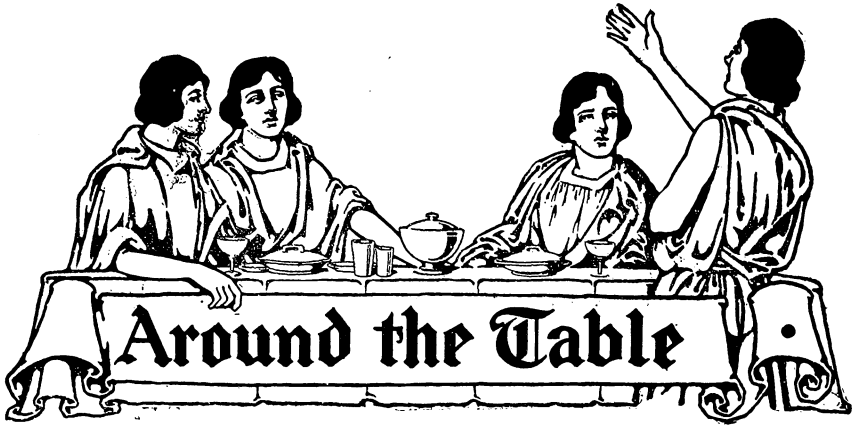
Through an error on the part of engraver, in placing the letters on the illustrations used as a frontispiece last month, our entire object in publishing these pictures was destroyed. The descriptions under the illustrations should have read as follows:

Figure A.

(a) Inclusion, bright red.
(b) Rim of amœba, dark blue.
(c) Interior, pale blue.

Figure B.

(a) Protoplasm or body, pink.
(b) Nucleus of epithelium, blue.
(c) Nucleus of pus cell, dark blue.
(d) Protoplasm, pale pink.



A STORY IS TOLD of a Young Farmer whose uncle, on his mother's side, died and bequeathed him a hundred thousand dollars. On receipt of his fortune he hied him unto the Great City, and soon became Well-known and Popular in the White Light District. He seemed willing to spend money like water, and all the Water-wagon Riders helped to show him how to Let-her-flow. As soon as it had all flowed away, he fled back to the Farm, donned his over-alls and was happy and contented once more.

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THEN HIS UNCLE, on his father's side, died, and likewise bequeathed him a hundred thousand dollars. On receipt of the letter with the Glad Tidings, the Young Farmer, leaned on his hoe and exclaimed: "O, Lord! Have I got to go through that all over again!"

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THAT WAS ABOUT how I felt when I received the little paper from Dr. W. I. Prime, in which in a few lines he solves the whole problem of root canal filling for us. Just think of it! No rubber dam! No special treatment, nor special filling for special cases. No trouble at all apparently to reach the apical foramen, or foramina as the case might be. Just cleanse with broaches and warm water, squirt some paste into the canals with a jiffy tube, and push it home with a pledget of cotton till the patient cries "Ouch!" Simple, isn't it? Oh! Would that it were true! But Dr. Prime says he has been using this method for over two years, without any failures, to his knowledge.

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DID YOU EVER NOTICE how many love stories end with, "And they lived happily ever after!" whereas if a second volume were written it would be filled with the nauseating details of the nasty divorce case? Well it is just the same with root canal treatment. In all these cases of easily filled and easily cured tooth roots, that "never gave trouble afterwards," the second chapters contain stories reeking with pus and putrescence;

❖ with stomach ulcers, arthritis, and death. Yet the dentist rests happy
❖ in the belief that "they never gave trouble afterwards!" Uugh!

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IT MAY BE TRUE, of course, that these teeth do not trouble the dentist
❖ again, but what about the patient?

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I WROTE SOMETHING LIKE THIS to Dr. Prime: I told him I thought
❖ this paste method of filling teeth all wrong, and that the publication of
❖ such articles do more harm than good; but in reply he wrote that he
❖ would like to have the paper published over his signature; that his ex-
❖ perience proved to him that it is a good method, and that he would like
❖ to hear from others on the subject.

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AS A METHOD of this character would be highly desirable if efficacious, and
❖ highly undesirable if erroneous, the best course seemed to be to publish
❖ the paper as requested, and along with it the opinions of men whose
❖ opinions will be respected. Consequently Dr. Prime's paper appears in
❖ this issue, which is especially devoted to the subject of root canal treat-
❖ ment and filling, and now let us hear the views of a few experts to
❖ whom Dr. Prime's formula was submitted. And be it remembered that
❖ what they say of one paste filling is equally applicable to all so-called
❖ antiseptic root canal pastes. Before passing this let me call attention
❖ to what Dr. Best says of pastes. He declares that he has obtained bac-
❖ terial cultures from all root filling pastes tested, and in this my own ex-
❖ periments bear him out.

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DR. J. P. BUCKLEY writes as follows: "In my opinion infections can occur
❖ about the root of an imperfectly filled canal, but such infection does not
❖ always occur. This is no excuse for being careless, neither is it an ex-
❖ cuse for using medicated pastes, with the end in view of having the
❖ medicine keep the canals sterile indefinitely. I believe it is well to have
❖ certain drugs, like thymol for instance, in our root canal filling material,
❖ but I do not believe there is any such thing as a 'permanently antiseptic
❖ root canal filling.' In regard to the paste from the New Hampshire den-
❖ tist, will say that anyone who would depend solely on phenol for ster-
❖ ilizing a putrescent canal cannot expect us to have much confidence in
❖ other remedies which he might suggest; and surely I would not think
❖ much of a paste for filling roots, with or without gutta percha, made of
❖ alum, thymol and glycerine. Both alum and glycerine are soluble in
❖ water."

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THE FOLLOWING IS FROM Dr. Elmer S. Best: "Possibly root canal
❖ pastes have some merit. They may ease the mind of the operator, but
❖ here their service ends. To my mind, there is as much sense in using
❖ such a preparation in a pulp canal which contains non-vital pulp tissue,
❖ with the idea of bringing about and maintaining asepsis, as there is in
❖ the case of the small boy, who persists in eating green apples because
❖ he believes in the advertised merits of 'Pain Killer.' Our experience has
❖ taught us that they are practically valueless; in fact some of them, in
❖ time, make excellent culture media for bacteria."

DR. J. R. CALLAHAN speaks with the emphasis born of experience: "The mummification of pulp tissue I have not seen, although I have been trying for a long time in my laboratory to mummify connective tissue. The nearest I have come to it is when fragments of pulp tissue are saturated with rosin and dried. To me true mummification that will stay mummified when sealed within the living body is a myth, born of a desire to shirk the responsibilities we assumed when entering the practice of our profession.

"THE VARIOUS NONSENSICAL combinations of loose and mostly insoluble, therefore irritating crystaline substances, are mixed to a thin pasty consistency by the addition of strongly antiseptic liquids, that are always irritants, *if true* antiseptic agents. This when pumped into partially prepared canals, where soon the antiseptic liquids disappear, leave the dry, porous, powdery mass within the canal, to become saturated with serum, etc.; which in a short time becomes pabulum for myriads of pathogenic micro-organisms, and makes a picture worthy of Puck.

"IT IS IMPOSSIBLE to fill a root canal with a plastic substance without forcing more or less of that substance through the larger foramina; at least, this fact calls for a neutral, stable and compatible substance."

DR. M. L. RHEIN says: "In every form of dental therapy outside of root canal therapy, it is possible to speak of results in a comparative way, so that even a fourth rate inlay may be of some benefit. In root canal therapy there can be no such comparatively good operation. The result of the treatment must leave the pulpless root in such condition that not only infective foci have been obliterated, but reinfection around that particular root made impossible. There can be no compromise with this principle. If this is not accomplished the patient has been seriously injured instead of benefited. So that, if such a result cannot be obtained, the tooth must be extracted as the lesser evil; sacrificing the tooth in order to avoid a possible toxemia.

"THERE IS NOTHING NEW in mummifying pastes. Many years ago the late Prof. Miller published a similar formula. Every one knows that portions of living pulp may be removed and the remainder remain alive for years. In such cases no blind abscess will result as long as any living pulp tissue remains in the canals. When this ceases to be the case, infection at the peri-apical end will take place whether such a paste is used or not. This is said with much positiveness, because so many radiographs of blind abscesses exist in teeth which have had their canals packed with similar mummifying paste.

"WHAT BENEFIT does the preservative action of these medicinal agents in the root canals have on the peri-apical entrance to the foramina where there is no paste? It is important in considering this question to know that infective matter in the root canal proper is doing no harm until it is forced through a foramen. The canals are cleansed, etc., in order that no infectious material should reach the peri-apical region from this location.

"AS FAR AS GENERAL INFECTION is concerned, out interest must always center in the peri-apical region. It is here that the nonhemolytic streptococcus comes floating along, and if any suitable nutriment exists around a foramen, the streptococci commence to nest there. It is on this account we have learned that even after all pathogenic tissue has been removed, secondary infections may take place in the peri-apical region, unless the root filling seals the peri-apical entrances to the foramina, as well as the canals themselves. Consequently, the honest practitioner must decide (if the patient is unable to have proper pulp treatment) whether the retention of a front tooth even is worth jeopardizing the life of the individual."

DR. RUSSELL W. BUNTING: "The filling of root canals is the most exact surgery which the general practitioner of dentistry is called upon to perform, and is perhaps the most important operation of his daily routine. The successful performance of root canal work demands an intimate knowledge of the anatomy of the teeth, and careful and painstaking labor in the extirpation of all pulp tissue. When the canals have been cleansed they should be filled with a substance which is insoluble in the body fluids and which is impervious to moisture.

"IT IS THEN LARGELY a question of the ability of the individual operator to find canals and to successfully operate upon them. It has been my experience that the careful operator will thoroughly extirpate and fill all root canals that are of considerable size, and will only fail in the extremely small and tortuous canals, and few of these. In such most difficult cases the use of the radiograph is of great assistance. But in case no means are at hand whereby further progress may be made, and such canals are rendered aseptic and filled as far as possible with a permanent root canal filling, the possibility of such canals giving future trouble has always been somewhat a doubt in my mind. When we examine radiographs of a large number of teeth and see how many root canals have been but partially filled by even the most careful operators; and when we note how few of these have undergone a subsequent infection, we cannot but feel that nature has means of protection, and that she may be successful in maintaining health when the odds are not too great against her.

"IN ALL SUCH CASES the use of germicides and dessicating agents should make the canal contents less favorable for bacterial growth and raise the factor of safety. I believe, however, that the final filling of all canals should be made with a material which is insoluble and impervious to moisture.

"HAD THE EGYPTIANS buried the mummified bodies of their ancestors in the banks of the Nile, they would have been no more foolish than the operator who depends upon mummifying agents to take care of considerable amounts of pulp tissue. Such agents should only be used when all surgical measures have failed and the operator is reasonably certain that the remains of pulp tissue are exceedingly small; and even then they are not safe."

JUST TO BE FAIR, and not have this entire talk on one side of the question, I will here introduce a communication from Dr. L. C. Burgard of Louisville, Ky. He says: "You will pardon me for calling your attention to certain conclusions that are apparently in antagonism to others. Take the question of root canal work. The methods of accurately working out the finer canals as popularized by Dr. Rhein and yourself are good, but is it a technique that is practical in the hands of ninety-five per cent. of the dentists?

"HOWEVER, HERE COMES DR. GRIEVES in a recent article and states that he finds as many blind abscesses on well-filled root canals as partially filled ones, and he further states that from twenty per cent. of the root canals it is physically impossible to remove the pulp completely. Also, Dr. Buckley teaches, if a canal is so small that a small broach will not enter, it is good practice to make a paste of formocresol and calcium phosphate, placing same over mouth of canals and covering with cement.

"AGAIN COMES DR. BLAIR, of this city, the 'Pus Cure' man, with sixteen radiographs so far made from patients, where after the tooth was devitalized only the main pulp portion was removed, and his paste sealed in, some of eight years' standing. The radiologist informs me that no pathological symptoms have developed. I admit this is contrary to surgical pathology.

"IN TEETH I HAVE WORKED on outside of the mouth, I find to open and enlarge these fine canals is a task, and sometimes I never succeed to my satisfaction, although when it comes to complete access, all is in my favor. Now to dry them and fill to end is another question. Therefore my aim being to adopt such routine or technique as is practical, I have come to this conclusion: First—That blind asbcesses, etc., are caused by the carrying of septic material into the canals and not so much from faulty removal of pulp or imperfect filling. Second—I believe in arsenical devitalization, because in so many instances it is not possible to sterilize the cavity so that septic material might not be carried in by using pressure anæthesia. Third—On opening my pulp chamber, I endeavor to be as careful with my technique in reference to sepsis as a surgeon. I remove the larger pulps with broaches, and the smaller, open to the best of my ability with Schreir's paste. But I will not consume any useless time on these hair-width canals. Then I seal in formocresol. This is recommended by Dr. Buckley, and I feel very grateful for the suggestion. What remnants I may not remove are then saturated with the cresol and asepticized with formalin. Fourth—Use euca-percha; find it so much easier to introduce than the rosin solution or chloro-percha. Use E. P. when it is so dry as to be 'mealy,' but by placing bottle in hot water it soon becomes a thick, smooth, oily consistency; to the E. P. I add two drams of iodoform to the ounce. This is pumped in and pulp chamber partially filled. Now, with a ball of cotton I crowd down on this and force to the very apex this E. P. Now crowd my points and pack it. Fifth—The small impossible canals. Partially open canals and chamber, dry out and fill with *Oxychloride* of Zinc (Ames). In practice this has

given uniform, absolute results. Teeth which I so devitalize, I never have any soreness in, and some of these chronic, sore teeth, where others have failed, are made absolutely comfortable."

DR. BURGARD IS KNOWN to me as a thoroughly conscientious practitioner, and his communication is published with pleasure, especially as it may lead to further discussion, and this subject must be continuously discussed until a safe and sane method of treatment is found, which can be practiced by the majority, as well as by just a few extra skillful men, who may enjoy the patronage of the very rich. Dr. Burgard's reference to Dr. Buckley, however, read alone, as he writes it, might lead some to believe that Dr. Buckley would approve the use of a paste for sealing small root canals, whereas it would seem that Dr. Buckley's real position is, that one should endeavor to cleanse and fill all canals in the regulation manner, and it is only in the rare cases where it is found to be impossible to enter a canal that the treatment quoted is recommended. To give Dr. Buckley opportunity to express himself on this subject Dr. Burgard's reference was sent to him for reply. He was likewise asked to express his views upon the addition of iodoform to euca-percha. He replies as follows:

"I DISLIKE VERY MUCH to place myself on record in connection with so important a proposition as the removal of pulps from, and the filling of small canals, in a letter dictated off hand. The better way for me to reply to your inquiry is to copy from my book under the heading 'Filling Small Canals,' page 325.* If anyone can read into it what you have quoted from the Louisville dentist, then I said what he has quoted. Whatever I said, properly interpreted, I wish to say again; for I have just reread it and am still of the same opinion.

"'FILLING SMALL CANALS.'—In filling all canals where we can enter nicely with a smooth broach, it is best to follow the technic outlined above, using a cone which will enter the canal. However, much we may regret it, there are canals, especially in the molar teeth, so small and tortuous that even a fine, smooth broach will not enter, at least, to any depth. It is useless to try to fill such canals with a gutta-percha cone. The methods of enlarging the canals by the use of acids and caustics, as referred to in connection with the destruction of pulp tissue in such canals, can be employed; but it is not always advisable to enlarge them sufficiently to admit a small cone. After the larger canal or canals in a multi-rooted tooth are filled in the ordinary manner, the smaller ones can be moistened with euca-percha compound, and this worked up or down into the canal. This process should be kept up for some time. The sides of the pulp chamber can now be moistened with eucalyptol compound and a piece of base plate gutta-percha, selected and softened in the flame, can be packed into the pulp chamber, when pressure can be made toward the small canals and the plastic gutta-percha forced into

*First Edition (1909).

❖ them. This is much better practice than simply filling the mouth of the
❖ canal with a gutta-percha cone. If the canal is so small and tortuous that
❖ even a small broach will not enter, and if it cannot be enlarged by the
❖ use of acids or caustics, as referred to previously, it is good practice to
❖ make a paste of formocresol and thymolized precipitated calcium phos-
❖ phate, placing the paste over the mouth of the canal, and, after working
❖ it up or down as best we can, covering it with cement.

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"AS PREVIOUSLY MENTIONED, there are many methods of filling root
❖ canals by which good results are attained. The method here outlined
❖ has served the author well. In closing, I desire to say that no reason-
❖ able amount of time should be considered lost in the treatment of teeth
❖ preparatory to the insertion of the final root canal filling. Under 'Pres-
❖ sure Anesthesia,' on page 281, in connection with the removal of the
❖ pulp tissue in small canals I said:

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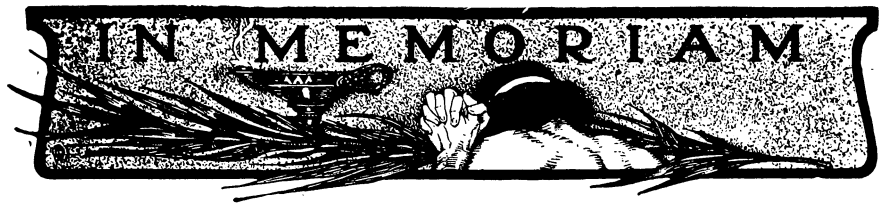
"'SMALL CANALS.'—There are many canals so small and tortuous that even
❖ a fine broach will not enter, to any depth at least. In these cases, after
❖ the hemorrhage from the larger canals has been checked and the blood
❖ removed, the pulp tissue in the small canals can be disorganized by the
❖ use of strong solutions of mineral acids or alkalies. The author prefers
❖ making a paste of sodium dioxid and absolute alcohol, placing the paste
❖ in the pulp chamber over the small canals, and working it down as far
❖ as possible with a smooth broach. The alcohol gradually evaporates,
❖ when the sodium dioxid can be decomposed into oxygen and caustic soda
❖ by placing a pledget of cotton in the cavity moistened with distilled
❖ water. After the reaction has taken place, the alkali can be neutralized
❖ with a weak solution of sulphuric acid (two per cent.). This process
❖ can be repeated until the desired end is attained. There are other means
❖ by which the same results can be accomplished, such as the use of a
❖ fifty per cent. solution of chemically pure sulphuric acid, strong solutions
❖ of potassium or sodium hydroxid, or a mixture of metallic potassium and
❖ sodium (Schreier's paste). These same agents can be used to advantage
❖ for the purpose of disposing of a remnant of a pulp in larger canals. It
❖ is not safe to anesthetize this remnant by means of pressure. The only
❖ cases on record to my knowledge, where toxic symptoms have resulted
❖ from the removal of a pulp by pressure anesthesia, followed an attempt
❖ to anesthetize a remnant of a pulp or in making the second application
❖ of the anesthetizing solution.

⌘ ⌘ ⌘

"I NOTICE I DID NOT reply to the latter part of your letter relative to the
❖ addition of iodoform to euca-percha. If you have my book you will
❖ notice that the formula for my Euca-percha Compound contains besides
❖ base-plate gutta-percha, eucalyptol, menthol and thymol. I have either
❖ a pharmacal or a therapeutic reason for each of these ingredients being
❖ in the preparation. You may know that had I felt that iodoform or
❖ other agents would add to the efficacy of the remedy, such would have

❖ been added. I know why men feel like adding such agents. It is with
❖ the blind thought that they make the remedy 'permanently antiseptic.'
❖ The sooner the members of our profession learn that there is no such
❖ thing, so far as I know, at least, and I think I know something about
❖ drugs, as a permanently antiseptic root canal filling material, the better
❖ it will be for all concerned. Our profession has listened to the siren calls
❖ of manufactures of root canal filling materials, most of which are zinc
❖ oxid-formalin pastes, and this phrase 'permanently antiseptic' has been
❖ a catchy one, and has resulted in 'selling the goods,' which is as far, I
❖ am sorry to say, as many manufactures are concerned."



American Academy of Dental Science.

Boston, Massachusetts.

Memorial to Dr. James Truman.

Professor James Truman, one of the most distinguished of the associate members of the American Academy of Dental Science, died at his home in Philadelphia, November 26, 1914, in the eighty-eighth year of his life. The loss of Professor Truman will be deeply mourned wherever dentistry is practiced. He was one of the founders of his profession, and one of the best exponents of its larger possibilities. He was also one of our foremost teachers, and the students who sat under his instruction revered him as they would a father. All who came in contact with Dr. Truman realized the exalted nature of the man and his nobility of character, his love of mankind and his charity for all. His was a fully rounded life, beginning early with large promise, equalling every anticipation in its maturity, fertile and beautiful to its close in the ripeness of its well-filled years.

Dr. Truman began the study of dentistry with his father, who was both a dentist and a physician. He graduated at the Philadelphia College of Dental Surgery in 1854. In 1864 he accepted the position offered him as demonstrator-in-chief of operative dentistry in the college from which he graduated. In 1865 Dr. Truman was elected to fill the chair of Dental Physiology and operative dentistry in the Pennsylvania Dental College, and he held that position until 1870, when he resigned. He was the editor of the *Dental Times* during this professorship, and during the four years of its existence the productions of his pen were published in this journal. On account of his health, he went to Germany and settled at first in Frankfort, practicing a year there. He then went to Hanover, and had among his patients many of the nobility and the wealthy residents of that province. In 1880 he returned to America and began practice in Philadelphia again. In 1882 he was elected Professor of Dental Pathology, Therapeutics and Materia Medica in the Department of Dentistry of the University of Pennsylvania. In 1883 he was made Secretary, and subsequently Dean, which position he held until he retired in 1896. In 1890 he was the editor of the *International Dental Journal*, and he held that position until the publication ceased in 1905. He received the degree LL.D. from the University of Pennsylvania in 1904.

Professor Truman was one of the pioneers of organized professional dentistry and brought to the solution of this problem a commanding personality, a vigorous and at times an aggressive intellectuality, a masterful command of language, and a dignity and forcefulness of mind which inevitably carried conviction to his hearers. We feel that no tribute to his memory can be too generous or too universal. Therefore, be it

Resolved, That in the death of Professor Truman, the American Academy of Dental Science loses one of its most distinguished fellows, who has been a signal honor to his profession, whose life was full of simplicity, tenderness and personal charm, whose advanced years were as beautiful as his manhood and his youth, a man who was loved wherever known.

R. R. ANDREWS,
EDWARD C. BRIGGS,
T. O. LOVELAND,
Committee.

Memorial to Dr. Louis Jack.

Dr. Louis Jack, a distinguished associate fellow of the American Academy of Dental Science, died at his home at Moyland, Pa., near Philadelphia, on December 9, 1914, in his eighty-third year. He was born at Germantown, a suburb of Philadelphia, March 26th, 1832, and enjoyed a practice of fifty-four unbroken years in his chosen profession.

At an early age he was taken by his parents to Beaver County, Pa., where he received his preliminary education at the Bridgewater Academy. At the age of twenty he returned to Philadelphia to look around to see what he might find to do, and soon decided to take up the study of dentistry. He first became associated with Dr. William R. White, in whose laboratory he was employed, and afterwards with Dr. C. C. Williams. It was at this time that he learned that the Philadelphia College of Dental Surgery, the first school in Pennsylvania to teach dentistry, was about to open its doors to students, and he was the first matriculate to register (September 2, 1852). He graduated in a class of nineteen on the twenty-eighth day of February, 1854.

Soon after graduating he opened his first office in the house of Dr. Robert Arthur and was closely associated with him. It was during the winter of 1855 that the cohesive property of gold foil was first brought to light in Dr. Arthur's laboratory.

He was instructor at the college for several years after his graduation, and in 1857 moved his office to Germantown, within a stone's throw of the spot where he was born, and in 1864 he returned to the city proper, where he remained until his retirement in 1908.

For several years during the early seventies he devoted much of his time after office hours to the construction of an electric mallet. This invention he gave to the dental profession, and for this act the Odontographic Society of Pennsylvania presented to him a testimonial of thanks for his "Professional Liberality and Loyalty to Professional Ethics."

He early recognized the importance of a good and lasting school for the teaching of dentistry in this country, was of the first to urge the institution of such a department at the University of Pennsylvania, and was instrumental in the formation of that department in 1877, and in which he was an occasional lecturer.

He was the "father member" of the Philadelphia Dental Club, having been a member covering a period of forty-two years, from its origin in 1872 until the time of his death.

He was interested in the development of the *International Dental Journal,* and was for a time president of the corporation which owned and published it. He was a member of the National Dental Association, the American Academy of Dental Science, the Odontographic Society of Pennsylvania, the Odontological Society of Pennsylvania, the Pennsylvania State Dental Society, the Academy of Stomatology, and the Philadelphia Dental Club.

Dr. Jack was the last survivor of the class of 1854 of the old Philadelphia College of Dental Surgery. He was a classmate of Professor James Truman, who died in Philadelphia only a month before.

Dr. Jack was a man of unusual ability, a gentleman of the highest character, dignified and refined. He was a sturdy advocate of all that was best in his profession. The hand of an artist showed itself unmistakably in everything he did. His skill as an operator gave to him an international reputation. The Academy honors the memory of Dr. Louis Jack, and sorrowfully adds one more illustrious name to its memorial records.

He did much to make our profession what it is to-day, one of the great ameliorating agencies of modern civilization.

He was not untimely taken. His life was prolonged many years, happy and famous.

We look upon his distinguished attainments with feeling of gratitude and appreciation. No man ever exercised a more genial personal influence over his friends, and those who knew him best realized the exalted character of the man and loved him. Therefore, be it

Resolved, That in the death of Dr. Louis Jack the Academy mourns one of its distinguished fellows, who has ever been an honor to his profession, and we deem it fitting to make a record of our sense of sorrow at his loss.

Robert R. Andrews,
Charles A. Brackett,
Eugene H. Smith,
Committee.

Dr. J. N. Crouse.

At the annual meeting of the Dental Protective Association, held in December, 1914, being the first meeting subsequent to the death of Dr. Crouse, a committee was appointed to prepare for publication a statement which might serve to show the appreciation of the members of the Association for the character and great services to the dental profession of Dr. J. N. Crouse, who organized the Association and was its president and executive head until shortly before his death.

Dr. Crouse displayed great ability and tremendous force of character, and enthusiasm and perseverance which finally overcame the general indifference and much active opposition of the dental profession, and won a sufficiently numerous membership in the Protective Association to provide enough funds to resist successfully the claims of the Crown and Bridge Company. The defense was so complete that the Crown and Bridge Company never collected anything of consequence from the dental profession. If the dentist had been obliged, for a year or two at first, to pay the licenses demanded by the Crown Company, as they had previously done for many years to the Goodyear Dental Vulcanite Company, the great services rendered by Dr. Crouse through the Dental Protective Association would have been universally acknowledged. As it was, appreciation for his services was less in evidence than a persistent and essentially unfair complaint and criticism of Dr. Crouse personally, and of his management of the affairs of the Protective Association. It did not seem to be understood that a plan of organization similar to that of our dental societies is not well adapted to fight a legal battle. It was indispensable, as in war, that one man should be in supreme command, able to choose his own helpers and subordinates, and to command the entire resources of the association for instant action whenever necessary. So far as appears, there was no other man in the dental profession who had the ability and the willingness to make the personal sacrifices necessary to accomplish what he did. The value of his services to the profession can never be known; that it amounted to millions of dollars there is no room to doubt.

Dr. Crouse always took an active interest in the welfare and progress of his profession, and for many years he was a familiar figure to all who attended dental society meetings anywhere. He came to Chicago from Mount Carroll, where he was then practicing, to become one of the charter members of the Illinois State Dental Society, and for some time before his death he was the only surviving charter member who had maintained his membership continuously. He was active in the administrative affairs of the three principal societies to which he belonged; the Chicago Dental

Society, the Illinois State Dental Society, and the American Dental Association (which was merged into the present Dental Association). He was President of each of them, and was for many years a member of the Executive Committee of the American Dental Association.

The last important service to the Dental Protective Association was the arrangement with Dr. Taggart, by which the members of the Association received licenses under his patents for a trifling sum (less than a dollar a year for the terms of the patents). In this he had the active assistance of the other directors, Dr. C. N. Johnson and Dr. J. P. Buckley, and without all three of them the plan probably would have failed.

Dr. Crouse did not receive in his lifetime the honor and appreciation from his profession that his great services deserved, and which undoubtedly will be accorded to him in the future. He will have a place among the great benefactors of the dental profession.

J. E. Hinkins,
C. E. Bentley,
Edmund Noyes (Chairman).

Dr. James Leslie Taylor.

Memorial Resolution Passed by the Dubuque Dental Society.

Whereas, Our Heavenly Father has seen fit to remove from this sphere of earthly labors our esteemed friend and President, James Leslie Taylor; therefore, be it

Resolved, That this Society deeply mourns the loss of one of its most cherished charter members; one who ever displayed a kindness of nature and generosity of heart which will always be remembered with the warmest of affection.

Resolved, That this Society extends its heartfelt sympathy to the widow, relatives and friends.

Resolved, That these resolutions be spread on the minutes of this Society and published in the home papers and the dental journals, and a copy be forwarded to his widow.

D. J. Heisey,
J. A. Meshinger,
G. W. Hoag.

National Society Meetings.

AMERICAN SOCIETY OF ORTHODONTISTS, San Francisco, Cal., August 30, 1915.
Secretary, Dr. F. M. Casto, 1520 Rose Bldg., Cleveland, Ohio.

PANAMA-PACIFIC DENTAL CONGRESS, San Francisco, Cal., August 30 to September 9, 1915.
Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

State Society Meetings.

ARIZONA STATE DENTAL SOCIETY, Phoenix, Ariz., November, 1915.
Secretary, Dr. J. L. O'Connell, Phoenix, Arizona.

MONTANA STATE DENTAL SOCIETY, Helena, Mont., July 15-17, 1915.
Secretary, Dr. F. W. Adams, Chicago Block, Billings, Montana.

NEW JERSEY STATE DENTAL SOCIETY, Asbury Park, July 21-24, 1915.
Secretary, Dr. John C. Forsyth, 430 E. State St., Trenton, N. J.

NEW MEXICO STATE DENTAL SOCIETY, Albuquerque, N. M., date will be announced later.
Secretary, Dr. J. J. Clarke, Artesia, N. M.

OHIO STATE DENTAL SOCIETY, Columbus, Ohio, December 7-9, 1915.
Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, Ohio.

SOUTH DAKOTA STATE DENTAL SOCIETY, Rapid City, S. D., July 22-24, 1915.
Secretary, Dr. T. E. Johnson, Rapid City, S. D.

UTAH STATE DENTAL SOCIETY will meet in San Francisco, Cal., during the Panama-Pacific Dental Congress in August, 1915.
Secretary, Dr. E. C. Fairweather, Boston Bldg., Salt Lake City, Utah.

VIRGINIA STATE DENTAL ASSOCIATION, Richmond, Va., Nov. 4-6, 1915.
Secretary, Dr. C. B. Gifford, Norfolk, Va.

WISCONSIN STATE DENTAL SOCIETY, Oconomowoc, Wis., July 13-15, 1915.
Secretary, Dr. O. G. Krause, 1209 Wells Bldg., Milwaukee, Wis.

F. D. I.

The next meeting of the International Dental Federation will be held September 2-3, 1915, at San Francisco, Calif.

Headquarters will be at the Clift Hotel.

TRUMAN W. BROPHY, President.

BURTON LEE THORPE, Assistant Secretary.

3605 Lindell Blvd., St. Louis, Mo.

American Society of Orthodontists.

There will be a meeting of the American Society of Orthodontists held Monday, August 30, 1915, at 9:30 A.M., at San Francisco, in the room assigned the orthodontia section of the Panama-Pacific Dental Congress. It is respectfully requested that as many members of the American Society of Orthodontists, as possible, be present.

F. M. CASTRO, Secretary-Treasurer.

F. C. KEMPLE, President.

Panama Pacific Dental Congress.

The Committee of Organization of the Panama-Pacific Dental Congress desires to call the attention of the members of the dental profession to the fact that the Congress will convene on time in San Francisco, on August 30th, under most favorable conditions for holding a large and successful meeting.

The program of papers and clinics is almost complete, and covers in a most comprehensive manner practically every subject pertaining to the practice of dentistry and oral surgery. About one hundred papers and two hundred and fifty clinics, or more, will be presented. Among the leading essayists and clinicians will be: Drs. Truman W. Brophy; H. S. Dunning; M. H. Cryer; C. H. Oakman; Rudolph Weiser, Vienna, Austria; A. B. Baer; T. B. Hartzell; H. M. Sherman; T. E. Carmody; W. H. G. Logan; H. P. Carlton; Prof. Bornsdorff, Finland; E. F.

Leffler; Garrett Newkirk; Herbert L. Wheeler; Louis Ottofy; Guy S. Millberry; M. L. Ward; I. N. Broomell; H. E. Friesell; V. A. Latham; F. B. Noyes; Josef Novitsky; C. H. Wilson; F. W. Hergert; C. J. B. Engstrom; V. E. Mitchell; Hart J. Goslee; J. Leon Williams; Alfred P. Rogers; A. H. Ketcham; E. L. Stanton; Weston A. Price; Louis Subirana, Madrid, Spain; R. Ottolengui; M. L. Rhein; H. A. Pullen; Vincenzo Guerini, Naples, Italy; Joseph Nalin, Montreal; W. H. Fitzgerald; Chas. McManus; C. O. Simpson; M. J. Congdon; R. B. Giffen; H. C. Chappel; Th. Weber, Finland; A. C. Wherry, John V. Conzett; F. W. Gethro; Edwin R. Kibler; Richard H. Riethmuller; T. Sydney Smith; Robin Adair; H. Page Bailey; Wm. A. Capon; L. P. Haskell; Jules J. Sarrazan; V. H. Jackson; W. H. O. McGehee; Arthur C. Peck; E. A. Bogue, and many others.

As far as possible no night sessions of the Congress will be held, leaving the evenings free for entertainment and the Exposition.

Over 1,200 front feet of space will be occupied by the leading dealers and manufacturers of the world with one of the most comprehensive exhibits of dental and pharmaceutical goods ever shown.

All the sessions of the Congress, the meetings of the sections, component societies and the exhibits will be held under one roof, in the Municipal Auditorium, one of the most magnificent structures of its kind, affording every opportunity for the effective and comfortable presentation of the program.

The Committee of Organization is sparing neither time, labor nor money to make the Congress the most notable event of its kind in the history of dentistry. To have missed it will be the regret of a lifetime. Transportation and hotel accommodations will be within the reach of all, and should be secured at once. Over 1,000 applications for membership are now on file with the Committee. Those who have not filed their application should do so now, so that arrangements may be made for their accommodation and entertainment.

No one interested in the history, progress and practice of dental science can afford to miss this great opportunity to attend the congress, and at the same time visit the greatest International Exposition the world has ever seen.

ARTHUR M. FLOOD, *Secretary.*

The Tour.

The Transportation Committee of the Panama-Pacific Dental Congress has endeavored to furnish schedule of train service which will afford the greatest amount of comfort, sight-seeing and pleasure, with the least amount of fatigue and inconvenience at a minimum of expense for all those coming from Eastern points. In order to meet the desires of the dentists, their families and friends wishing to attend this Congress, we have deemed it best to adopt the following schedules:

Lv. Boston .....12:00 Midnight Aug. 22nd Via N. Y., N. H. & H. R. R.
Ar. New York ..... 7:00 A.M. " 23rd " "
Change from Grand Central to the Pennsylvania Station.

Lv. New York	2:04 P.M.	Aug.	23rd	Via	Pennsylvania R. R.	
" Newark	2:27 P.M.	"	"	"	"	
" Philadelphia	4:31 P.M.	"	"	"	"	
" Harrisburg	7:25 P.M.	"	"	"	"	
" Altoona	11:00 P.M.	"	"	"	"	
" Pittsburgh	1:35 A.M.	"	24th	"	"	
" Columbus	7:00 A.M.	"	"	"	"	
" Logansport	1:15 P.M.	"	"	"	"	
Ar. Chicago	5:00 P.M.	"	"	"	"	

Train to be switched to Chicago & Northwestern Station. A few hours for sight-seeing and recreation in Chicago.

Lv. Chicago	10:45 P.M.	Aug.	24th	Via	Chicago & Northwestern		
" Cedar Rapids	6:00 A.M.	"	25th	"	"	"	
" Marshalltown	8:18 A.M.	"	"	"	"	"	
" Ames	9:50 A.M.	"	"	"	"	"	
Ar. Omaha	3:45 P.M.	"	"	"	"	"	
Lv. Omaha	4:20 P.M.	"	"	"	Union Pacific Railway		
" Grand Island	8:20 P.M.	"	"	"	"	"	"
Ar. Denver	7:30 A.M.	"	26th	"	"	"	"
Lv. Denver	7:45 A.M.	"	"	"	Denver & Rio Grande		
Ar. Colorado Springs	10:30 A.M.	"	"	"	"	"	"

Spend day and night here for sight-seeing.

Lv. Colorado Springs	10:55 A.M.	Aug.	27th	Via	Denver & Rio Grande		
" Royal Gorge	1:50 P.M.	"	"	"	"	"	"
" Glenwood Springs	10:10 P.M.	"	"	"	"	"	"
Ar. Salt Lake City	12:01 Noon	"	28th	"	"	"	"
Lv. Salt Lake City	1:45 P.M.	"	"	"	Western Pacific Ry.		
Lv. Feather River Canyon	7:00 A.M.	"	29th	"	"	"	"
Ar. San Francisco	5:45 P.M.	"	"	"	"	"	"

PASSENGERS FROM FOLLOWING POINTS SHOULD LEAVE AS FOLLOWS TO JOIN SPECIAL TRAIN.

Lv. Washington	3:10 P.M.	Aug.	23rd	Via	Pennsylvania R. R.		
" Baltimore	4:20 P.M.	"	"	"	"		
Ar. Harrisburg	6:40 P.M.	"	"	"	"		
Lv. Louisville	8:20 A.M.	"	24th	"	"		
" Indianapolis	11:40 A.M.	"	"	"	"		
Ar. Chicago	5:40 P.M.	"	"	"	"		
Lv. Dayton	9:05 A.M.	"	"	"	"		
Ar. Chicago	5:40 P.M.	"	"	"	"		
Lv. Cleveland	7:20 A.M.	"	"	"	Lake Shore Railway		
" Toledo	10:05 A.M.	"	"	"	"	"	"
Ar. Chicago	4:00 P.M.	"	"	"	"	"	"
Lv. Buffalo	11:00 P.M.	"	23rd	"	"	"	"
Ar. Chicago	11:50 A.M.	"	24th	"	"	"	"
Lv. Detroit	12:30 P.M.	"	"	"	Michigan Central Ry.		
Ar. Chicago	7:40 P.M.	"	"	"	"	"	"
Lv. Minneapolis	10:05 P.M.	"	"	"	Chicago & Northwestern		
" St. Paul	10:40 A.M.	"	"	"	"	"	
" Sioux City	7:50 A.M.	"	25th	"	"	"	
Ar. Omaha	11:25 A.M.	"	"	"	"	"	
Lv. Des Moines	8:30 A.M.	"	"	"	"	"	
Ar. Ames	9:35 A.M.	"	"	"	"	"	
Lv. St. Louis	Evening	"	24th	"	Any Line		
" Kansas City	Evening	"	"	"	"	"	
Ar. Omaha	Morning	"	25th	"	"	"	

Railroad Fares.

Going via the route of the Official Train to San Francisco, Cal., thence returning via any direct line from California, rates will be as follows:—From Boston, $106.75—From New York City, $98.80—From Philadelphia, $95.20—From Chicago, $62.50. Going via route of Official Train to San Francisco, thence to Los Angeles and returning via North Pacific Coast (Portland, Seattle or Vancouver), the cost will be $17.50 higher (destination of tickets, San Francisco), with an additional charge of $4.00 if side trip Los Angeles to San Diego and return is desired. The entire route must be selected at the time tickets are purchased. Correspondingly low rates from your home station.

Sleeping Car Rates to San Francisco.

From	Lower	Upper	Compartment	Drawing Room
New York City.....	$18.00	$14.40	$50.50	$63.00
Philadelphia	17.50	14.00	49.00	62.00
Chicago	13.00	10.40	36.50	46.00
Omaha	11.00	8.80	31.00	39.00

GENERAL INFORMATION.

In order to secure sleeping car accommodations it will be necessary to make application as soon as possible.

On account of the heavy travel it would be advisable to make hotel reservations in advance, and these can be secured through the Official Exposition Hotel Bureau, Flannery Building, San Francisco, Cal.

Literature descriptive of the route of travel, the Expositions, etc., will be sent you on request.

Any of the representatives noted below will be pleased to assist in arranging your trip and make whatever sleeping car reservations you may require.

REPRESENTATIVES: CHICAGO & NORTHWESTERN LINE.

Boston, Mass., 322 Washington St., J. E. Brittain, Gen. Agt.
Buffalo, N. Y., 301 Main Street, H. B. Loucks, Jr., Gen. Agt.

Itineraries of National Dental Association.

The members of the Transportation Committee of the National Dental Association, adopted three official railway routes and schedules to San Francisco from the East, and are now engaged in calling the attention of the profession to the schedules planned. Members of the committee are located in different sections of the States, and are prepared to give members of the profession in their localities, general information regarding the railway routes, fares, etc.

The railway trains scheduled as arranged by the committee going to San Francisco have special equipment and train service. The routes are popular, the trains are of the most comfortable cars; the arrangements being complete, insures pleasant associations and encourages good fellowship.

The Railway Itinerary of the official trains as published in the February number of the ITEMS OF INTEREST, page 154, should be examined carefully by all who are intending to make the trip, as the plan adopted in employing our special and official trains is to encourage comfort in transit and general good fellowship. The committee suggests that one should confer with his local railway agent, or one of those that are referred to, in our itineraries, and choose a route for the return trip, which is necessary before purchasing a reduced fare ticket.

The committee request that editors of all dental journals, officers of State and local dental societies and all members of the profession do what they can to interest members of the profession in joining us in our trip to attend the Congress, and in that manner add to the attendance and assure the success of the Congress.

TRANSPORTATION COMMITTEE, NATIONAL DENTAL ASS'N.
Dr. Victor H. Jackson (Chairman), 40 E. 41st St., N. Y.
Dr. H. F. Hoffman, 324 Metropolitan Bldg., Denver, Colo.
Dr. Jos. D. Eby, 509 Fourth National Bank Bldg., Atlanta, Ga.
Dr. D. C. Bacon, Columbus Memorial Bldg., Chicago, Ill.
Dr. Henry W. Weirick, 503 Mechanics Bldg., San Francisco, Cal.
Dr. J. P. Marshall, 7401 Hazel Ave., St. Louis, Mo.

Examination of Dentists for the U. S. Army.

The Surgeon General of the Army announces that examinations for the appointment of Acting Dental Surgeons will be held at Fort Slocum, New York; Columbus Barracks, Ohio; Jefferson Barracks, Missouri; Fort Logan, Colorado; and Fort McDowell, California, on Monday, October 18, 1915.

Application blanks and full information concerning these examinations can be procured by addressing the "Surgeon General, U. S. Army, Washington, D. C."

The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between twenty-one and twenty-seven years of age, a graduate of a dental school legally authorized to confer the degree of D.D.S., and shall be of good moral character and habits.

Acting Dental Surgeons are employed under a three years' contract, at the rate of $150.00 per month. They are entitled to traveling allowances in obeying their first orders, in changing stations, and in returning to their homes at termination of service. They also have a privilege of purchasing certain supplies at the Army commissary. After three years' service, if found qualified, they are promoted to the grade of dental surgeon with the rank of first lieutenant, and receive thereafter the pay and allowances appertaining to that rank.

In order to perfect all necessary arrangements for the examination, applications must be in the possession of the Surgeon General at least two weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There will be twelve vacancies to be filled.

ROBERT E. NOLB, Major, Medical Corps, U. S. Army.

New Jersey State Board of Registration and Examination in Dentistry.

Advance Notice.

At the meeting of the State Board of Registration and Examination in Dentistry, to be held at the State House, Trenton, N. J., December 6, 7, 8, and 9, 1915, the following practical tests will be required:

Insertion of an approximal gold filling, compound approximal amalgam filling and a silicate filling, besides a practical test of the applicant's ability in oral prophylaxis. Also preparation of a cavity for an inlay with wax pattern.

Prosthetic dentistry. Five-piece bridge and Richmond crown in addition to an anatomical articulation of a full upper and lower set of teeth. Teeth to be furnished by applicant. Wax bites properly trimmed and in place on models for inspection before setting up teeth.

In addition, dental jurisprudence and bacteriology will be added to the theoretical examination.

In accordance with the above law, the Secretary will issue application blanks to applicants only upon presentation of the required certificate from the Superintendent of Public Instruction, Trenton, N. J.

Applications must be filed complete ten days before the date of the examination.

Address all communications for further particulars to

JOHN C. FORSYTH, Acting Secretary,
430 E. State Street, Trenton, N. J.

VERNON D. ROOD, D.D.S., Secretary.

Dental Red Cross Fund.

At the meeting of the American Institute of Dental Teachers, held at Ann Arbor, Michigan, on January 26th, it was decided to take steps that should result in the raising of a fund to be used through the Red Cross Society in giving relief and aid to the soldiers in Europe who are suffering from oral and dental injuries. The President was instructed to appoint a committee to take charge of this matter. President F. W. Gethro, under this instruction, appointed the following Executive and General Committees:

Executive Committee—Henry W. Morgan, E. A. Johnson, Ellison Hillyer, John F. Biddle, Secretary; C. R. E. Koch, Chairman.

General Committee:

E. C. Kirk, Philadelphia
J. H. Kennerly, St. Louis
H. C. Miller, Portland, Ore.
D. M. Gallie, Chicago
John F. Biddle, Pittsburgh
E. T. Darby, Philadelphia
Alfred Owre, Minneapolis
B. Holly Smith, Baltimore
E. A. Johnson, Boston
Frank Holland, Atlanta
D. M. Cattell, Memphis
Frederick R. Henshaw, Indianapolis
S. W. Bowles, Washington
E. H. Smith, Boston
A. H. Hipple, Omaha
Ellison Hillyer, New York
Truman W. Brophy, Chicago
D. H. Squire, Buffalo
H. E. Friesell, Pittsburgh
Henry W. Morgan, Nashville
I. N. Broomell, Philadelphia
Wallace Wood, New Orleans
Frank T. Breene, Iowa City
H. L. Banzhaf, Milwaukee
J. G. Sharp, San Francisco
G. V. Black, Chicago
W. T. Chambers, Denver
H. M. Seamans, Columbus
J. D. Patterson, Kansas City
N. S. Hoff, Ann Arbor
C. N. Johnson, Chicago
H. L. Wheeler, New York
L. E. Ford, Los Angeles
C. R. E. Koch, Chicago
H. B. Tileston, Louisville

The Executive Committee is contemplating the issue of contribution certificate booklets. Each booklet will contain twenty (20) certificates or coupons certifying that the holder thereof has contributed 25 cents to this fund. This certificate will be neatly lithographed, something like national currency. It will be printed in lilac ink—the color of the dental profession—and bear upon its face the Red Geneva cross.

It is hoped that the dental schools, dental students and dental societies, as well as the profession at large, will become sufficiently interested in this propaganda to secure a large enough fund, through these small contributions, to secure real relief for the class of war sufferers for which it is designed. That it may aid in the establishment of several special hospitals or wards devoted to dental and oral surgery injuries, within the belligerent zone of Europe, is the ultimate purpose of this movement.

It is expected that these booklets will be ready for distribution on or before March 1st. Applications for them may be made to Dr. John F. Biddle, of Pittsburgh, Pa., Secretary of the Executive Committee, or to Dr. C. R. E. Koch, 31 West Lake Street, Chicago, Chairman of the committee, before March 1st. After that date all the members of the Executive Committee and General Committee will be in a position to supply them.